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Part V – Water Quality Issues

Beach Closures and Contamination
Cruise Ship Discharges
Revise Water Quality Memorandum of Agreement
Water Quality Protection Program Implementation

Beach Closures and Contamination Action Plan

Goal Statement
The goal of the Beach Closure/Microbial Contamination Action Plan is to reduce microbial contamination in Sanctuary waters and to better identify sources of contamination in order to effectively allocate resources and evaluate health risks. Success will be evaluated through the attainment of ocean water quality standards and the reduction of beach closures and postings within the Sanctuary.

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Introduction

The central coast of California is internationally known for its incomparable shoreline. Travelers come from around the world to enjoy outstanding recreational opportunities including surfing, diving and kayaking; to view the spectacular coastal scenery; to observe wildlife resources such as sea otters, whales, and seabirds; and to enjoy the seemingly pristine beauty of the ocean. In 1992, public concern over the conservation of this exceptional resource led Congress to designate the Monterey Bay National Marine Sanctuary for its ecological significance and singular beauty. Since this designation, runoff and spills along the Sanctuary's coastline have periodically resulted in high levels of coliform bacteria being detected in coastal waters, resulting in hundreds of beaches closures or warnings annually.

Coliform bacteria are used as indicator organisms, and while they may not cause disease in humans, their presence tells us that water may be contaminated with organisms that do cause health impacts ranging from fever, flu-like symptoms, ear infection, respiratory illness, gastroenteritis, cryptosporidiosis, and hepatitis. Not only can humans be affected, but research into the cause of an alarming rise in mortality among the threatened southern sea otter population, shows that infectious agents have been implicated in nearly forty percent of these deaths. Preliminary data suggest that many of these deaths are caused by protozoal parasites and bacteria that are spread by fecal contamination of near shore marine waters by terrestrial animals or humans.

The local economies are also affected by beach closures. Tourism is the second largest industry in the Central California region after agriculture. Although statistics are lacking, since much of the tourism is related to the coast, an image of closed or contaminated beaches could be a multi-million dollar threat to the local economy. A significant aquaculture and kelp harvesting industry within the MBNMS is highly dependent upon unpolluted water, and beach closures cost local economies tourist dollars and jobs, and represent a loss to those who had planned beach visits.

Sources of contaminated water include runoff from urban, suburban and rural areas, an aging sewer infrastructure system pressed to meet increasing demands, contaminated flows from creeks and rivers and unidentified sources. Contributing factors that generate these sources include illicit storm drain connections, improper disposal of materials which clog pipes and cause overflows, cracked or damaged pipes, overflow of sewer systems during storm events, septic system leaching, non-point pollutant loading exposed to storm runoff, and various domestic and wildlife sources.

Beach Closures and Warnings

Beach closures or warnings result from a known discharge of sewage or laboratory results that indicate that the probable number of indicator organisms contained in a water sample exceed water quality standards. Since the identification of pathogens such as viruses in ocean water is difficult, time consuming, and expensive, current water quality testing methodology relies on the usage of the more readily detected and quantified coliform and fecal streptococci bacteria as indicator organisms. These organisms include total coliform, fecal coliform and enterococcus. County Health Officers can take three discrete actions including closing a beach, issuing a warning, or announcing a rain advisory based on beach water quality monitoring data, sewage spills, and storm events.

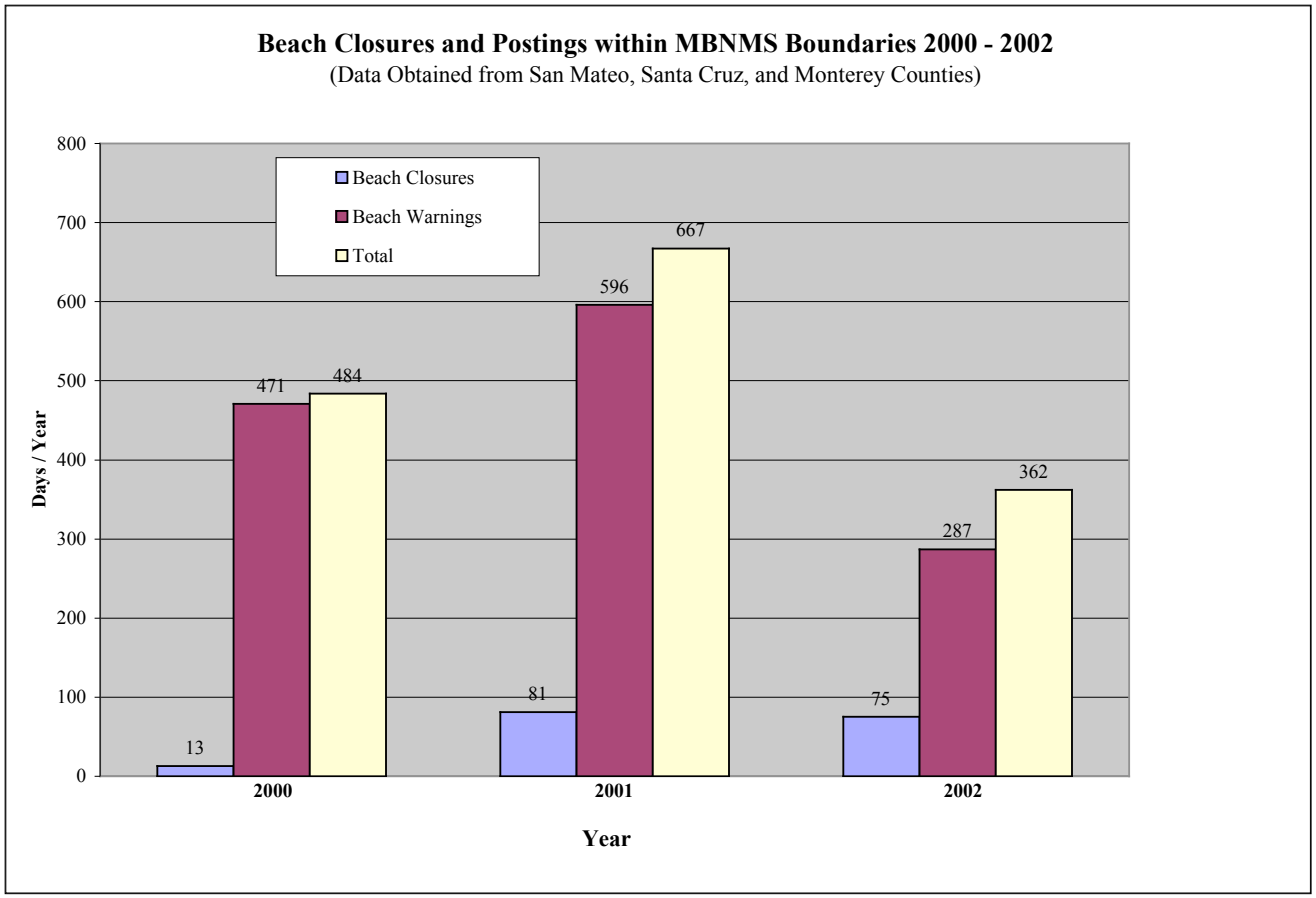
- A "Beach (ocean) Closure" occurs as a result of a known sewage spill or from repeated incidences of exceeding bacterial standards due to an unknown source. A closure is a notice to the public that the water is unsafe for contact and that there is a high risk of getting ill from swimming in the water. When a beach is closed, signs are posted alerting the public to stay out of the water.

- A "Beach Warning" sign means that at least one bacterial standard has been exceeded, but there is no known source of human sewage. The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The placement of signs may be short term, when a single bacterial indicator standard is exceeded, or more permanent where monitoring indicates repeated contamination (e.g. from a storm drain). Warnings may also be posted where sources of contamination are identifiable and can be explained as not of human origin (e.g., resident marine mammals or seabirds).

- A "Rain Advisory" is often issued when it rains because it is known from past experience that rainwater carries pollution to the beach. After a rain, bacteria counts usually exceed the State standards for recreational water use.

Beginning in 1999, AB411 required local health officers to conduct weekly bacterial testing between April 1 and October 31 of waters adjacent to public beaches that have more than 50,000 visitors annually and are near storm drains that flow in the summer. This increased monitoring is responsible for a pronounced jump in the number of beach closures and postings between 1998 and 1999. Since this initial jump, Sanctuary beaches have continued to suffer from hundreds of closures or postings annually (Table 1).

Figure 2 - Sanctuary Beach Closures and Warnings 2000-2002



Not only is the public concerned with the high number of closures and warnings, but they are also concerned that the methods used to monitor and post beaches are insufficient to accurately detect contamination and warn the public accordingly. While California has instituted the most comprehensive water quality monitoring programs in the nation, the program is compromised because current methods of enumerating indicator bacteria are too slow to provide full protection from exposure to waterborne pathogens.

Indicator bacteria assays take 18 to 36 hours to complete and during this time beachgoers may be exposed to harmful pathogens. By the time the beach is posted, the indicator bacteria may no longer be present in the near shore waters. Thus a beach may be open when it is contaminated, and posted when it is clean. Also, this lag time makes it difficult to track sources of microbiological contamination as the source has often become dispersed over a wide area by the time investigators arrive on the scene. Beach water quality monitoring is also temporally and geographically limited. Resources preclude environmental health departments from monitoring entire stretches of beaches, and at most, these locations are monitored bi-weekly. Recently published data show that temporal changes in indicator bacteria levels in beach water occur much more rapidly.

Many types of animals produce the indicator organisms, and a high percentage of beach closures and warnings are the result of unknown or diffuse sources. Data contained in the 2000 California Beach Closure Report shows that statewide:

- 37% of warnings posted and closures statewide were a result of unknown sources;
- 37% were caused by creeks/rivers;
- 12% were attributed to sewer lines;
- 12% to stormdrain/urban runoff;
- 3% to wildlife;
- <1% each to combined sewer overflow, domestic and agricultural animals, and rain.

In viewing these data it is important to recognize that there is a fundamental difference between beach closures and beach warnings. Beach closures result from known sewage spills or repeated exceedances of standards from unknown sources, whereas beach warning are a result of an exceedance of standards, but where there is no known source of human sewage (Tables 2, 3). Domestic discharges account for a high percentage of beach closures, but closures occur less frequently than warnings.

Figure 3 - Sources of Contamination – Postings

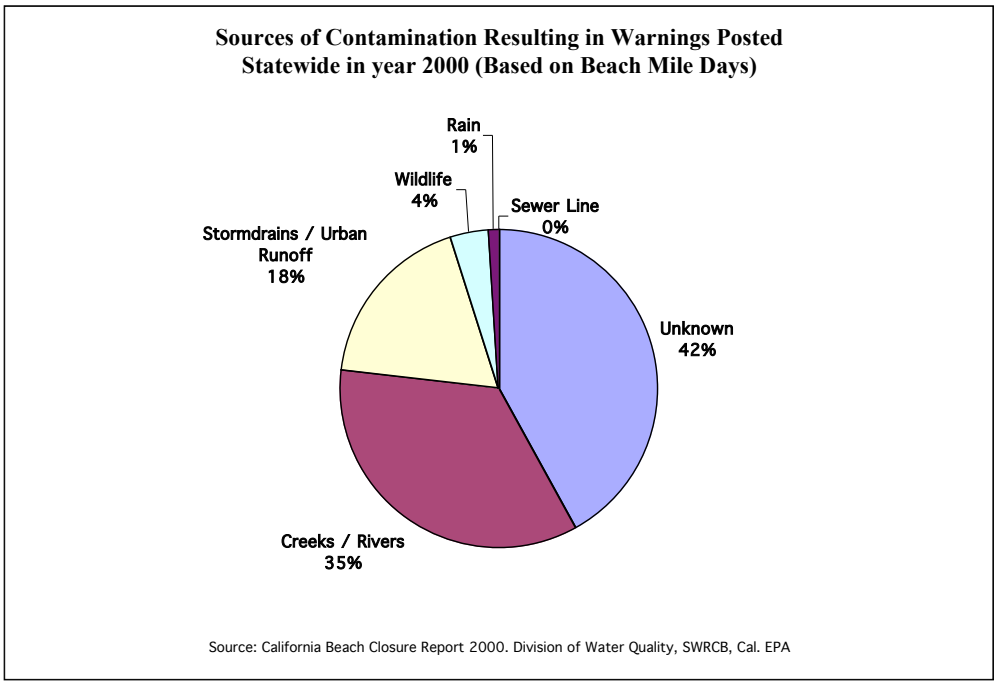
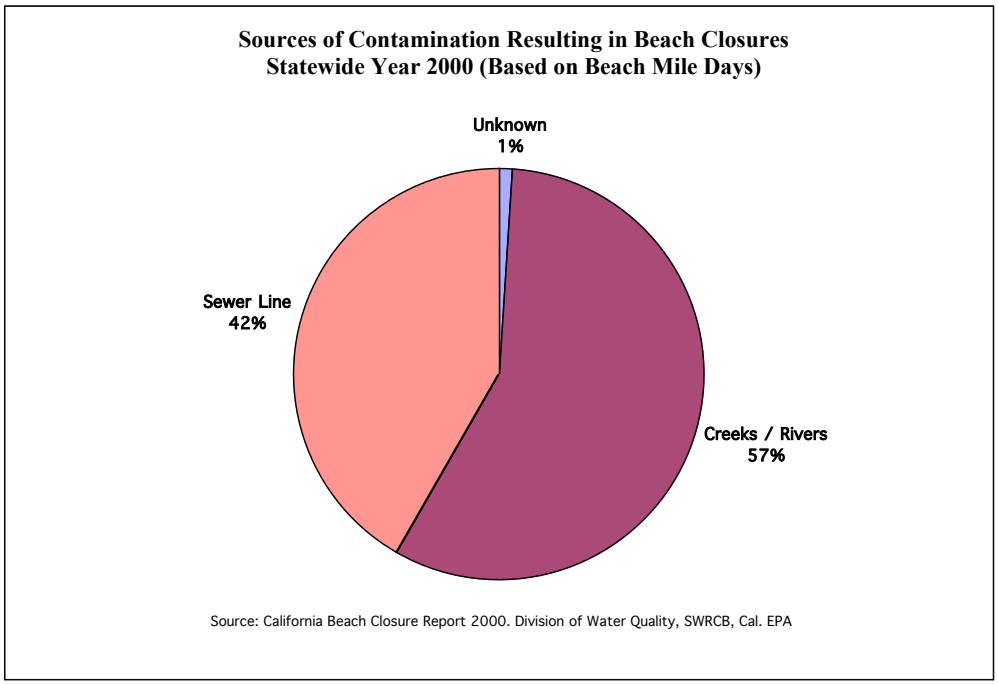


Figure 4 - Sources of Contamination - Closures



Domestic discharge represents an increased risk to human health and an emphasis will continue to be placed on the prevention of sewage spills through maintenance, repair, and illicit discharge detection from publicly owned sewage collection and treatment facilities. However, discharges from these facilities account for a small proportion of the total number of closures and postings. The majority of closures and postings are caused by diffuse or unknown sources, and strategies will also need to be developed that effectively reduce the bacterial loading to these sources. A wide range of potential risks of disease are also associated with the diffuse nature of these sources, illustrating the need for strategies that further research and develop analyses that better characterize near shore pollution and its effect on human and marine health.

Existing Statutory and Regulatory Framework

The Federal Clean Water Act and the California Water Code (Porter-Cologne Water Quality Control Act) establish the framework under which water quality is regulated in California.

Basin Plan and Ocean Standards

The State of California is divided into nine regional boards that regulate water pollution in their region. Each of these boards is responsible for administering regulations established by the Code, which directs each of the boards to develop a regional water quality control plan, or "Basin Plan." Basin Plans describe the beneficial uses of each of the region's water bodies, including warm and cold-water habitat, fish spawning, recreation, drinking water supply and several others. They also describe the water quality that must be maintained in order to allow those uses. The regional boards implement the Basin Plans by issuing and enforcing state Waste Discharge Requirements or NPDES permits (National Pollutant Discharge Elimination System, pursuant to the Federal Clean Water Act). Anyone wishing to discharge waste to inland surface waters or the ocean from a pipe or waste facility (a “point source”) must obtain a NPDES permit from the regional board. The boards establish monitoring programs to be conducted by the discharger as a

way of measuring compliance with permit provisions. Generally, sewer collection systems tributary to treatment facilities are permitted by Waste Discharge Requirements whereas the treatment facilities themselves are permitted through the NPDES system. The State Water Resources Control Board has stated that while sanitary sewer overflows and sewage spills are not subject to minimum mandatory penalties, the California Water Code provides for penalties for unauthorized discharges.

The State Water Resources Control Board is responsible for development and review of the California Ocean Plan, the Regional Boards are responsible for implementing the California Ocean Plan through NPDES permits.

AB 411& AB 1946

Increasing concern about beachwater quality prompted the approval of Assembly Bill 411 (AB411, the Right To Know Bill), which amends the Health and Safety Code of the State of California required the California State Department of Health Services to develop statewide beachwater-quality criteria and monitoring regulations.

Weekly monitoring that tests for the three indicator organisms is required from April to October at all beaches with more than 50,000 annual visitors or at beaches located in areas adjacent to storm drains that flow during the summer. Adjacent to the Sanctuary, San Mateo, Santa Cruz, Monterey, and San Luis Obispo counties each have beaches that meet these criteria. These results are compared to the criteria below, developed by the State Department of Health services in response to AB 411.

Total Coliform – 10,000 MPN
Fecal Coliform – 400 MPN
Enterococcus – 104 MPN

MPN is the most probable number, defined as the statistical concentration of bacteria in 100mL of sample water. Beaches with water samples that exceed the state's criteria for any one of the three indicators are to be posted with conspicuous warning signs to notify the public of health risks associated with swimming in these areas.

AB 1946, was approved in 2000 as a follow up to AB 411. This bill improves upon data collection requirements and public disclosure standards, and requires the state to collect better information on the type of action taken (i.e. advisories or closures) when beach testing uncovers pollution as well as the specific source of the problem.

Sanctuary Enforcement

The Sanctuary also plays a role in enforcing MBNMS regulations that prohibit discharges directly to the Sanctuary (with a number of exceptions, none which apply here), or discharges from outside the boundary of the Sanctuary that enter and injure a Sanctuary resource. The MBNMS enforcement philosophy is based on preventive enforcement, with a strong emphasis on outreach and education. While the Sanctuary has in the past relied primarily on the two Regional Water Quality Control Boards for enforcement of discharge violations, it does have enforcement capabilities that can result in civil penalties. Sanctuary emergency response staff

are also involved when spills occur to gather information on the extent of the spill and assess damage to Sanctuary resources. The Sanctuary also prohibits the construction of new waste water treatment plant outfalls into the Sanctuary.

NPDES
In addition to the point source and waste discharge requirement programs, the State and Regional Boards regulate "non-point" source discharges via the Storm Water NPDES program. The storm water program is divided into two phases. Phase I was promulgated in 1987 and regulated "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater, construction activity disturbing 5 acres of land or greater, and ten categories of industrial activity. In the Sanctuary watersheds, the City of Salinas is covered under a Phase I permit.

Phase II of this program is now underway, and in 2003, the SWRCB adopted a General Permit for storm water discharges from regulated Small MS4s (municipalities within an urbanized area with a total population of at least 50,000, individual municipal populations of 10,000, and a population density of at least 1,000 per square mille) and small construction activities.

TMDLs
TMDLs (Total Maximum Daily Loads) are designated for state waters where water quality standards are not attained or that show signs of impacted for beneficial uses. Waters that do not meet standards or support their beneficial uses are listed on the 303(d) list of water quality limited segments. TMDL are load allocations to be developed by the Regional Water Quality Control Boards identifying the total amount of pollution that can be discharged to 303(d) listed waterbodies from all land use categories in the watershed. While several California beaches have been listed on the 2002 303 (d) list for Coliform Contamination, no beaches adjacent to the Sanctuary have been included on this list.

Previous Sanctuary Efforts Related to Microbial Contamination and Beach Closures
The Sanctuary's Water Quality Protection Program (WQPP) is a partnership effort designed to enhance and protect the physical, chemical and biological conditions in the Sanctuary and its adjacent lands. The WQPP has identified a variety of water quality issues and problems in the Sanctuary and its watersheds including sedimentation, nitrates, persistent pesticides, metals, oil and grease, and detergents, and has developed and initiated implementation of several plans to address them. The WQPP previously identified coliform contamination as a threat to human and ecosystem health, and although it was not a key focal point of previous efforts, several programs undertaken through previous plans have partly addressed the issue.

The Sanctuary's Water Quality Protection Program plans, Action Plan I: Implementing Solutions to Urban Runoff and Action Plan II: Regional Monitoring, Data Sharing and Interagency Coordination, both recommend additional assessments of coliform contamination sources, and follow-up technical strategies to address the urban runoff components of coliform contamination. Volunteer monitoring programs coordinated by the Sanctuary's Citizen Watershed Monitoring Network such First Flush, Urban Watch and Snapshot Day monitoring events have provided several years of data characterizing both wet and dry season urban runoff, including collecting

and analyzing samples for bacterial indicator organisms. These data have been useful to local jurisdictions in identifying locations in the watersheds that need additional attention.

The Model Urban Runoff Program, developed by the cities of Monterey and Santa Cruz, the Monterey Bay National Marine Sanctuary, California Coastal Commission and the Regional Water Quality Control Board also includes guidelines for monitoring and source analysis for coliform bacterial and outlines an array of steps for technical follow up and education to reduce inputs.

The WQPP Agriculture and Rural Lands Action Plan was developed in 1999 to address agricultural water quality issues. The Agriculture and Rural Lands program indirectly plays a part in dealing with coliform contamination as sediment fate and transport can play an important role in bacterial survival. The sediment environment is more favorable to bacterial growth and survival, and it has been shown that stream sediments can contain bacteria counts much higher than the overlying water column. Additionally, nutrients are adsorbed on to particulate surfaces, thereby enabling the attached bacteria to grow more rapidly than those in free suspension, and increased turbidity reduces light penetration into the water column, enhancing the survivability of bacteria.

The Sanctuary also works with local jurisdictions to garner financial resources to address Microbial contamination issues. Recently, the Monterey Bay Sanctuary Foundation worked with the Cities of Monterey, Pacific Grove, and the Monterey County Department of Environmental Health to submit a joint proposal for funds under the Proposition 40 – Clean Beaches Initiative. The proposal seeks funding for a coordinated approach to addressing the beach closures and postings through sewer infrastructure diagnostics and repairs, a genetic source analysis, and monitoring and education programs. The Sanctuary also works with local jurisdictions to raise public awareness of Microbial contamination issues. In January of 2001, the Sanctuary co-hosted two public forums with local cities and counties on beach closures designed to share information on the sources of contamination and potential solutions to the problem.

This past work has focused on issues that are related to Microbial contamination, but the Sanctuary has not yet dealt comprehensively with the subject of beach closures and postings. Effectively addressing this issue will require a regional approach that cuts across jurisdictional and political boundaries. An effort to reduce Microbial contamination and improve beach water quality monitoring will therefore build on the WQPP Memorandum of Agreement designed to facilitate interagency cooperation and signed by eight federal, state, and local entities during Sanctuary designation in 1992. The Sanctuary hopes to continue to successfully work with stakeholder groups and develop a plan that will effectively characterize the beach closure issue, create strategies to reduce the number of beach closures and postings, and identify funding mechanisms to implement the recommendations.

Strategy BC-1: Research

Strategy Description
Laboratory analysis of the three indicator organisms can take up to forty-eight hours, and during this time beachgoers may be exposed to harmful pathogens. Also, recent studies show that beachwater quality can vary greatly on both a temporal and spatial scale. To address these problems, the Sanctuary will seek to monitor developments in rapid indicator assessment, explore other potential indicators or methods that detect the pathogens themselves, and perform upstream genetic source analysis studies.

Activity 1.1: Investigate Rapid Indicator Assessment
Current indicator analysis requires 18 to 24 hour incubation times, and monitoring is geographically and temporally limited. Finding methods that can process samples in less time will reduce the risk to public health by ensuring that water quality is accurately evaluated and posted.

Implement methods that will result in quicker turn around times between sample and results (e.g. biosensors, enzymatic assays, Polymerase Chain ReActivity (PCR))
Research and implement real-time, continuous monitoring techniques
Team with research organizations with expertise in real-time monitoring – MBARI, Southern California Coastal Water Research Project (SCCWRP), SIMON

Status: Phase 1
Potential Partners: Monterey Bay Aquarium Research Institute (MBARI), Moss Landing Marine Labs (MLML), Sanctuary Integrated Monitoring Network (SIMoN), Southern California Coastal Watershed Research Project (SCCWRP), State Water Resources Control Board's Beach Water Quality Workgroup (BWQW), Counties for Implementation, private sector research laboratories/firms

Activity 1.2: Explore Other Potential Indicators
An ideal indicator organism would be found only when disease-causing agents were present at densities that could cause human health problems. Recognizing that current fecal indicators fall short of this goal, and are neither the most precise nor easily assayed, evaluate alternate indicators such as:

- Fecal sterols: Fecal Sterols, such as coprostanol, are formed in the gut of human and higher mammals by chemical or biological reactions, and tests can differentiate between human and animal sources
- Caffeine: Caffeine is a compound that is present in numerous beverages as well could be used as an indicator
- Long-chain alkylbenzenes (LABs –synthetic surfactant): LAB's are widely used as surfactants in commercial detergents, and as they are purely synthetic they are highly indicative of human sources. Because they are present up to one order of magnitude lower than fecal sterols, they are regarded as complementary to the fecal sterols

Status: Phase 2

Potential Partners: MBARI, SIMoN, SCCWRP, BWQW, Counties, private sector research laboratories/firms, Water Environmental Research Foundation (WERF), UC Davis

Activity 1.3: Explore the Potential to Analyze for Specific Pathogens (e.g., T. gondii)
Indicator organisms do not directly correspond to human health problems, and only indicate the potential presence of pathogens from untreated or partially treated sewage or contaminated runoff. Alternatively, waterborne pathogens are difficult to detect and quantify, and specific methodology to detect them in samples is only in the development stages. Research in this area should be monitored for techniques that allow for the direct measurement agents suspected of impacting human and marine health.

Status: Phase 2
Potential Partners: Centers for Disease Control, UC Davis, SCCWRP, BWQW

Activity 1.4: Conduct Genetic Studies at Key Locations to Distinguish between Animal (Including Land Based, Marine Mammals And Birds) and Human Bacteriological Sources
It is difficult to pinpoint the exact physical location of the source of bacteriological contamination of beaches. However, distinguishing between anthropogenic and animal sources of contamination will help to better assess health risks and allocate resources. Information on the human or animal origin of fecal pollution gives an indication of the types of pathogens that may be expected, the risk of infection, and the treatment that may be required to control the transmission of disease. Animal fecal pollution is not without risks and, while many of the risks rare unknown, it is generally believed that animal sources pose less risk. Several methods have been studied to varying degrees of success including examining the ratio between fecal coliforms to fecal streptococci or total coliforms, multiple antibiotic resistance (MAR) analysis, ribotype analysis / genetic fingerprinting, and analyzing for human enteric viruses.

A. Coordinate with agencies and scientist on appropriate techniques
B. Actively seek partnerships between research institutions and local agencies

Status: Phase 1
Potential Partners: SCCWRP, BWQW, Counties, MBARI, MLML, universities

Strategy BC-2: Monitoring

Strategy Description
Resources and staffing limit the frequency and number of beaches that can be monitored on a regular basis, which can potentially jeopardize public health. This action will seek to develop scientifically justified monitoring protocols to ensure that contact with contaminated waters is reduced to the highest practicable extent. Collaborate with existing monitoring programs, and utilize the best available indicators and analysis equipment developed through ongoing research.

Activity 2.1: Include the Use of Technological Advances Noted in the Research Section, Such as Real Time Probes, Developed Through Ongoing Research, to Sample Beaches More Frequently and Expand the Geographic Extent of Sampling
Expand to locations with reported incidences of illness or where physical features (e.g. proximity to runoff, enclosed waters) suggest high contamination levels. Work with local jurisdictions and the Sanctuary Citizens Watershed Monitoring Network to secure funding to monitor these beaches.

Status: Phase 1
Potential Partners: County Departments of Environmental Health (County DEH's), MBARI, MLML, SIMoN, SCCWRP, BWQW, private sector research laboratories/firms

Activity 2.2: Encourage and Develop Funding for Local Jurisdictions to Perform Upstream Monitoring of Chronically Closed/Posted Beaches from Unknown Sources to Identify Sub Watersheds and Specific Locations Contributing to the Problem
Partner with local public works agencies, and when feasible, enlist volunteers to assist in assessment through collaboration with the Sanctuary Citizens Watershed Monitoring Network.

Status: Phase 1
Potential Partners: County DEH's, public works, CCLEAN, Sanctuary Citizens Watershed Monitoring Network

Strategy BC-3: Notification Program

Strategy Description
User groups desire to have access to water quality information before they depart for the beach. This strategy will seek to continue and expand upon existing notification systems.

Activity 3.1: Develop Improved Notification System for User Groups
Ensure that user groups have the appropriate beach status information prior to their departure and if beach are closed or warnings are posted, provide expected date of open status.

A. Continue and expand recorded phone messages
B. Continue and expand county websites and link to regional Sanctuary website.
C. Evaluate additional links / programs to improve access to information
D. Ensure that groups are aware of notification resources through public relations announcements
E. Build upon Surfrider's fax notification system

Status: Phase 1
Potential Partners: State and County parks, TV and radio news media, Coastal Commission, Surfrider, regional dive and surf shops

Strategy BC-4: Geographic Information System (GIS)

Strategy Description
GIS can be a powerful tool that decision makers can use to define problems and allocate resources. Local jurisdictions are encouraged to utilize GIS when making decisions about infrastructure replacement or when performing upstream analysis. Project prioritization could be determined by their proximity to sensitive areas or heavily used beaches. For the purpose of this plan, GIS refers to any mapping or drawing package, whether or not data is externally referenced.

Activity 4.1: Expand and Continue to Encourage Local Jurisdictions to Map Septic Sewer and Storm Drain Lines, and to Record Data on Reported Spills, Blockages, and Lateral Line Cleaning Work. Work with Jurisdictions to Develop Programs Which Are Not Already Doing So

A. Coordinate efforts with those developing Sewer System Management Plans
B. Coordinate methods including software, projections, formats
C. Encourage data and technology sharing between jurisdictions

Status: Phase 1
Potential Partners: Public Works agencies, Coastal Conservancy, Central Coast Joint Data Committee (CCJDC)

Activity 4.2: Encourage Local Jurisdictions to Map Problem Infrastructure Areas, Sensitive Habitats, Land Uses, Outfall Locations, and Critical Beaches

Status: Phase 2
Potential Partners: Public Works agencies, Coastal Conservancy, CCJDC

Activity 4.3: Determine Proximity of Problems to Sensitive Areas and Heavily Used Beaches to Develop Priorities and Generate Funding

Status: Phase 2
Potential Partners: Public Works agencies, Coastal Conservancy, CCJDC

Strategy BC-5: Source Control Program

Strategy Description
The working group identified private and public sanitary sewer systems, septic systems, and urban runoff as primary routes of anthropogenic bacterial contamination. The following are actions that will seek to reduce the input of contamination from the various sources.

Activity 5.1: Work with Local Jurisdictions to Enhance the Repair and Replacement of Sewer Mains

A. In order to determine the best allocation of resources and funding, prepare a regional list of main line repair and replacement projects drawing on those developed by local jurisdictions; tie-in to GIS database
B. Rank projects based on downstream closures and postings, proximity to sensitive resources, or high-use beaches
C. Leverage this information and this Action Plan to pursue and obtain funding sources

Status: Phase 1
Potential Partners: Coastal Conservancy, SWRCB, RWQCBs, Coastal Commission, public works agencies, state bond propositions, MRWPCA

Activity 5.2: Work with Local Jurisdictions to Reduce the Number of Sanitary System Overflows and Exfiltration from Publicly Owned Sewage Collection Systems

Blockage
Team with entities developing Sewer System Management Plans required by Waste Discharge Requirements. Ensure adequate ongoing maintenance and promote community support through outreach and public awareness so that jurisdictions have the financial ability to accomplish this task.

A. Utilize GIS and monitoring to improve identification, management, and follow up of main line obstructions, particularly locations with repeated incidences
B. Leverage resources and assist with the development source control measures and public outreach and education, focused on preventing sewer system overflows resulting from the introduction of fats, grease, and other materials that cause blockages. Expand these programs to a regional level
C. Ensure proper installation, testing, and inspection of sewers
D. Develop local or regional approved vendor list, franchise, or program similar to clean business certification program for grease haulers and line clearing vendors
E. Investigate alternative main line cleaning technologies
F. Assist local jurisdictions in funding line clearing and pump station maintenance / repair activities, and utilize the Sanctuary to develop public support for these activities
G. Encourage jurisdictions to require reporting of interceptor / trap cleaning and lateral cleaning
H. Encourage tracking in GIS
I. Conduct technical training / public education and outreach

Illicit Connections

A. Continue and expand detection program under Phase 2 efforts

Status: Phase 1
Potential Partners: Local public works agencies, MRWPCA

Activity 5.3: Work with Local Jurisdictions to Reduce the Number of System Upsets Caused by Private Laterals

Create mechanisms that identify and correct chronic problem areas. Public agencies cannot implement lateral maintenance because of the disruption that would occur on private property during rehabilitation, costs involved, and potential liability issues. Homeowners, for their part, are also reluctant to undertake repairs, as costs are typically $3,000 or more. This strategy encourages cities to implement a method that will reduce the number of overflows from laterals.

A. Three Strike Ordinance: if city crews are called to a site three times in a one-year period, encourage local jurisdictions to issue a cease and desist order to the homeowner to repair problem within ten days. If the problem is classified as a nuisance, city crews can fix immediately. (Phase 2)
B. Sale / transfer inspection program: work with local jurisdictions to develop an ordinance that requires the inspection of laterals prior to the sale or transfer of a property, which will require maintenance or repair of defective or damaged laterals. (Phase 1)
C. Develop "approved" vendor list for the Sanctuary cities and counties, model after existing program such as clean business program. (Phase 1)
D. Develop voluntary lateral inspection and repair program. (Phase 1)

Potential Partners: Local jurisdictions, city councils, realty associations

Activity 5.4: Work with Local Jurisdictions to Reduce Input from Septic Systems

A. Encourage jurisdictions to develop GIS layer of houses on septic systems and correlate to problem areas based on data from Citizens, city, county, and AB411 monitoring efforts. (Phase 1)
B. Target areas suspected of impacting water quality with educational materials. (Phase 2)
C. Inform citizens on proper use and maintenance. (Phase 1)
D. Ensure that pumpers are reporting system maintenance and require pumpers to submit logs. (Phase 1)
E. Encourage local jurisdictions to implement sale / transfer inspection program. (Phase 1)
F. Encourage local jurisdictions to utilize clean business–type program for pumpers (Phase 1)
G. Hold pumpers strictly accountable for improper disposal

Potential Partners: Local public works agencies, individual haulers, CCJDC, MRWPCA

Activity 5.5: Work with Local Jurisdictions to Reduce Microbial Contamination from Urban Runoff/Storm Drain

A. Coordinate Beach Closure action plan strategies with the Urban Runoff action plan, MURP, MERITO, and Phase 2 programs.
B. Leverage efforts to prepare regional educational, outreach and technical materials that address the issue of beach closure.
C. Investigate cost effective measures to treat or divert urban runoff where source control measures prove ineffective
D. Increase number of RV pump-out stations and provide incentives for their use
E. Remove sediments in catch basins and other areas prior to first rains of the season
F. Develop mechanism to address waste from homeless camps
G. Pet Droppings - Utilize existing materials and as necessary develop new methods, materials, or devices that will ensure that people clean up after their pets

Status: Phase 1
Potential Partners: RWQCBs, non-profits for outreach, public works agencies, MRWPCA

Strategy BC-6: Technical Training

Strategy Description
Raise the level of awareness of each of these industries to their impacts on the overall system. Let plumbers know that line cleaning can move clogs into city mains, train restaurant personnel in the proper use and maintenance of grease equipment, and promote a reporting program that will alert city staff to potential problems, e.g. problem laterals, behavioral problems, septic system malfunctions, improper grease disposal.

Activity 6.1: Working through Local Jurisdictions, Educate Plumbers, Grease Trap, and Sewer Industry on Proper Cleaning Techniques, Promote Reporting Program

A. Raise the level of awareness of each of these industries to their impacts on the overall system
B. Train restaurant personnel in the proper use and maintenance of grease equipment
C. Promote a reporting program

Status: Phase 1
Potential Partners: Public Works Agencies, MRWPCA, grease manufacturers

Activity 6.2: Working through Local Jurisdictions, Utilize Existing, or Adapt New Outreach/Training Modules for Targeted Public Servants (E.G. Planners, Technical Personnel - Coordinate with Phase II Efforts and Existing MBNMS Materials)

Status: Phase 1
Potential Partners: Public Works Agencies, MRWPCA

Activity 6.3: Develop Spill Response Training Module (See Emergency Response Strategy)

Status: Phase 1
Potential Partners: Public Works Agencies, MRWPCA

Strategy BC-7: Education

Strategy Description
The diffuse nature of microbial contamination illustrates the need to find solutions on a broad scale that reduce input at its source. Building off of existing programs, this strategy will develop a comprehensive educational program that increases the public's understanding of the issue, the sources of contamination, and the solutions. Because funding is critical to source control, the education strategy will also seek to develop support for local funding initiatives.

Activity 7.1: Develop Coordinated Regional Education Program Building and Expanding on Existing Materials and Efforts
Coordinate with regional Phase II efforts, and use existing MBNMS educational material, MERITO, and the Urban Runoff action plan education efforts. Utilize MBNMS to provide coordinated support to ensure consistent messages, facilitate collaboration with various groups, and leverage resources. Examples include topics such as proper septic tank maintenance, pet care, and grease disposal.

Status: Phase 1
Potential Partners: Local jurisdictions, MRWPCA, non-profits, city councils, RWQCBs

Activity 7.2: Develop Public's Understanding of the Importance of Reducing Microbial Contamination, the Sources of Contamination, and How They Can Be a Part of the Solution

Status: Phase 1
Potential Partners: Local jurisdictions, MRWPCA, non-profits, city councils, RWQCBs

Activity 7.3: Develop Understanding of Need for Local Funding to Address Issue

Status: Phase 1
Potential Partners: Local jurisdictions, MRWPCA, non-profits, city councils, RWQCBs

Strategy BC-8: Enforcement

Strategy Description
The Sanctuary will seek to coordinate and strengthen enforcement actions in line with the SWRCBs enforcement policy and Sanctuary discharge prohibitions.

Activity 8.1: Encourage Fair and Consistent Enforcement of Discharges Under the SWRCBs Enforcement Policy and Sanctuary Discharge Prohibitions

A. Review past enforcement efforts by the RWQCBs for consistency with the SWRCBs "Water Quality Enforcement Policy"
B. Identify cases where enforcement has not occurred, and analyze for consistency with either the State or Sanctuary policy, and develop protocols to address inconsistencies or gaps in existing policy

Status: Phase 1
Potential Partners: RWQCBs

Activity 8.2: Develop a Notification Mechanism between the Permittees, RWQCBs and the MBNMS
Work with RWQCBs and others to ensure that the Sanctuary will be notified of new and ongoing enforcement investigations and incidents of sewage discharges that have the potential to enter the Sanctuary.

Status: Phase 1
Potential Partners: Permit holders, RWQCBs

Activity 8.3: Coordinate and Strengthen Enforcement Actions with the RWQCBs
Sanctuary regulations provide for civil penalties for discharges directly into the Sanctuary or for discharges from outside the boundary of the Sanctuary that enter and injure a Sanctuary resource. Historically, the Sanctuary has relied on the RWQCBs for enforcement of sewage discharges, and Sanctuary policy generally avoids adding Federal enforcement fines if the State has already fined a violator, and this will continue to be the case. However, in some instances (based on prior violations, nature of discharge, agency resources, impact to Sanctuary, etc.), the Sanctuary will initiate enforcement actions, particularly when the RWQCB has not, or has been unable to do so under its authority. The Sanctuary will work with the Regional Boards ensuring consistent enforcement, and should also develop a coordinated system to track spills and ensure adequate emergency response (see *Strategy BC-9*). Notification mechanisms developed in Activity 8.2 will facilitate this action.

Status: Phase 1
Potential Partners: RWQCB

Strategy BC-9: Emergency Response

Strategy Description
This strategy will seek to track spills and ensure that a rapid, 24-hour a day spill response is available and that proper containment, disinfection and source control policies are developed and implemented.

Activity 9.1: Improve Reporting and Tracking of Spills

A. Develop a single number which when called by local governments or sewage districts, will alert all appropriate agencies, including the Sanctuary, to the presence of a spill.
B. Develop and publicize a system to inform the public and coastal businesses of local contacts to notify when they observe a spill, to ensure rapid containment response
C. Develop an interagency system to adequately log spills and track follow up actions

Status: Phase 1
Potential Partners: RWQCBs, local governments, OES

Activity 9.2: Encourage Local Governments to Develop Cross-Departmental, On-Call Systems, that Will Ensure Rapid, 24 Hour a Day Spill Response that Will Ensure Rapid Response And Maximize Containment.

A. Utilize continual on-call departments to reduce potential lag time associated with the mobilization of off-duty departments

Status: Phase 1
Potential Partners: Local jurisdictions

Activity 9.3: Encourage Local Governments to Develop Model Spill Response Program that Ensures Proper Techniques for Containment, Disinfection, and Source Control

A. Build off of Combined Sewer Overflow Technology Fact Sheets developed by the EPA.

Status: Phase 1
Potential Partners: EPA, local jurisdictions, RWQCB

Activity 9.4: Provide Sanctuary Enforcement Presence Where Necessary in the Field to Follow Up on Reported Spills and Assess Potential Injury to the Sanctuary

Status: Phase 1
Potential Partners: RWQCB

Strategy BC-10: Funding

Strategy Description
The implementation of many of the strategies contained in this plan are limited most by the lack of adequate funding. This strategy details methods in which the Sanctuary will work with its partners to obtain outside funding as well as to develop support for local funding initiatives.

Activity 10.1: The MBNMS Will Coordinate with Local Jurisdictions to Locate Funding Sources and Leverage Action Plans and Monitoring Results to Secure Funds for Strategy Implementation

- State bond and proposition funds
- California Coastal Conservancy, SWRCB and RWQCBs
- Federal Sources
- League of California Cities
- Quantify economic loss from beach closures, e.g. to support grant writing efforts

Status: Phase 1
Potential Partners: Local jurisdictions, RWQCBs, Coastal Conservancy, Coastal Commission, Trade and Tourism and Commerce departments, non-profits

Activity10.2: Build Public Support for Utility Fees, Bonds, or Other Local Funding Initiatives
Recent spills, beach closures, warnings, and studies linking human pathogens to sea otters have raised public awareness to the issue of microbial contamination of Sanctuary waters. However, many citizens do not realize the costs associated with addressing the issues and the burden that local jurisdictions face. A component of this strategy as well as the public education and outreach strategy, will seek to develop public support for bonds, fees, or other local initiatives that can pay for some of this much needed work.

Status: Phase 1
Potential Partners: Local jurisdictions, RWQCBs, Coastal Conservancy, Coastal Commission, Trade and Tourism and Commerce departments, non-profits

Citations

California Beach Closure Report 2000. Division of Water Quality, SWRCB, Cal. EPA
Jensen, P., Hanadi, R., Battenfield, T., Payne, S. Public Works. Identifying Bacteria Sources.
SWRCB General Counsel, Question and Answer Paper. April 17, 2001

Cruise Ship Discharges Action Plan

Goal Statement
To prevent impacts to MBNMS resources from cruise ship discharges

This action plan was developed by an internal MBNMS staff team.

MBNMS Staff Contact
Brad Damitz Assistant Management Plan Coordinator

Introduction
Large cruise ships recently began visiting Monterey, with three visits in 2002, and 14 visits scheduled for 2003. These ships can provide local businesses with economic benefits, particularly if they introduce the region to tourists who may return for later visits. However, both the public and businesses have raised concerns about environmental issues associated with these ships. Cruise ships are of enormous size, capable of generating massive volumes of waste. Currently the largest vessel in the global cruise line fleet, Royal Caribbean's Voyager of the Seas, is larger than an aircraft carrier at 1,017 feet in length and holds more than 5,000 passengers and crew.

Worldwide, cruise ships constitute a large and rapidly growing industry. The industry consistently grew at a rate of eight percent per year between 1992 and 2002. By the end of 2001, the worldwide fleet of cruise ships totaled 167 vessels; the industry will increase the fleet by 38 vessels by 2005, an increase of forty-five percent for this five-year period. Passenger numbers in North America are expected to increase from 6.8 million in 2001 to 11.9 million in 2010. Currently 643,000 cruise ship passengers embark annually from California ports in San Francisco Bay, Los Angeles, and San Diego. Although partly constrained by the lack of local docking facilities, cruise ship visits to Monterey are likely to continue to grow as the fleet is shifting from international to more domestic cruises, and due to a new cruise ship docking facility planned for San Francisco Bay.

Due to the recent increase in Cruise Ship visitation to the Monterey Bay, and concern over potential impacts to marine resources from these vessels, this issue has drawn significant attention from the public, during the past year. MBNMS staff have received numerous comments requesting that the MBNMS address this issue. At their February 7th meeting, the MBNMS Advisory Council passed a resolution recommending that MBNMS staff pursue a regulatory prohibition on harmful discharges from cruise ships. In response to this resolution, a regulatory prohibition is being investigated as part of the Joint Management Plan Review Process.

Environmental Impacts of Cruise Ships and Current Regulation
Due to their sheer size, capacity for passengers, and environmental practices, cruise ships can cause serious impacts to the marine environment. The main pollutants generated by a cruise ship are: sewage, also referred to as black water; gray water; oily bilge water; hazardous wastes, and; solid wastes. Large cruise ships (passengers and crew of ___) can generate as much as eleven

million gallons of waste per day. For the municipal sewer outfalls in the MBNMS, 11 million gallons of water per day is equivalent, on a per capita basis, to the discharge from XX people.

While large cruise vessels are the equivalent of small cities in regard to waste production, they are not subject to the strict environmental regulations and monitoring requirements that land based facilities are required to comply with, such as obtaining discharge permits, meeting numerous permit conditions and conducting monitoring of discharges. However, there are a number of existing laws that address some aspect of cruise ship discharge. The various pollutants contained on cruise ships, their environmental impacts, and their current regulatory controls are outlined below.

Sewage
Sewage includes vessel sewage and wastewater from medical facilities. Sewage from ships is generally more concentrated than that from land based sources, as it is diluted with less water when flushed (three quarts versus three to five gallons). Sewage discharge can contain bacteria or viruses that cause disease in humans and other wildlife. It can present a public health concern, if discharged in the vicinity of marine life harvested for human consumption, or in or near waters used for recreational activities such as swimming, diving, or boating. Nutrients in the sewage can cause eutrophication, whereby excessive growth of algae depletes oxygen and can lead to the death of fish and other organisms. Additionally, chemicals and deodorants including chlorine, ammonia, or formaldehyde are often used in Marine Sanitation Devices (MSD), and can present a threat to marine organisms. Volumes of sewage for a typical cruise ship have been estimated at between five to ten gallons per person per day, or up to 210,000 gallons per week.

Sewage is classified as a pollutant under the Clean Water Act (CWA). However, cruise ships are not subject to the National Pollutant Discharge Elimination System (NPDES) Permitting Program, which requires land-based facilities to obtain a permit for discharges under the CWA . Black water from cruise ships is however regulated under Section 312 of the CWA, which requires vessels to possess a US Coast Guard certified MSD. A MSD is a piece of equipment designed to treat or store sewage prior to discharge. A type II MSD must meet a water quality standard of 200 fecal coliform per 100 ml of water, for sewage treatment. A type III MSD, also referred to as a holding tank, is designed to contain sewage until it can be disposed of. Section 312 of the CWA is jointly implemented by the USCG and U.S. Environmental Protection Agency, and states may also enforce Federal standards. Section 312 requires the use of MSDs for all vessels within 3 miles of shore, and vessels over sixty-five feet to have a type II or type III MSD. In certain cases the Act can also be applied to any discharge that occurs beyond the three-mile limit but may affect waters within the limit.

Under the Clean Water Act, raw sewage can be legally discharged beyond three nautical miles. However, MBNMS regulations prohibit the discharge of raw sewage and require that discharges from vessels throughout the Sanctuary occur through a properly functioning MSD that meets the standards of Section 312 of the Clean Water Act. Recent discussions indicate this MBNMS prohibition may not be widely known and enforcement may be difficult.

Due to the large volume of their sewage discharges, many cruise ship systems nationwide do not routinely meet the performance standards identified in Section 312 of the CWA. Also, the

standards set for MSD-generated sewage are significantly lower than those required by municipal treatment plants. The intent of several of the MBNMS regulations was to avoid impacts from large-scale human activities. For instance, no new municipal or private sewage outfalls may be constructed in the Sanctuary. The sheer volume of discharges from large cruise ships seems to conflict with the intent of the MBNMS regulations.

Graywater
Graywater consists of wastewater from sinks, showers, laundry, and galleys. It can contain a number of pollutants including: suspended solids, oil, grease, ammonia, nitrogen, phosphates, copper, lead, mercury, nickel, silver and zinc, detergents, cleaners, oil and grease, metals, pesticides, and medical and dental wastes. A typical cruise ship produces an estimated 1,000,000 gallons of graywater per week.

Currently, Federal regulations do not prohibit the discharge of gray water in state or U.S. waters, with the exception of the Great Lakes and the state waters of Alaska. MBNMS regulations generally prohibit discharges to the Sanctuary, but provide an exception for discharges from routine vessel operations such as graywater.

Bilge Water
Bilge water consists of fuel, oil, and wastewater from engines and machinery that collects, along with fresh water and seawater in the area at the bottom of the ship's hull, as a result of spills, leaks, and routine operations. It may also contain other materials such as rags, cleaning agents, paint, and metal shavings. A typical cruise ship generates an estimated 25,000 gallons of bilge water per week.

Discharge of fuel or oil, including oily bilge water, is subject to stringent requirements of the Oil Pollution Act and section 311 of the CWA. Under this law, which is enforced by the USCG, vessels are prohibited from releasing any discharge with an oil content of greater than fifteen parts of oil per one million parts water (ppm). Beyond twelve miles, discharges with oil content greater than 100 ppm is prohibited. Several cruise line companies require their vessels to have additional equipment that treats the oily bilge water to 5ppm. Discharge of oily wastes is also addressed under the International Convention for the Prevention of Pollution from Ships (MARPOL), and under the Act to Prevent Pollution from Ships (APPS), which incorporates MARPOL provisions into federal law. They set requirements for the release of oil and noxious substances, set standards for reporting discharges, and establish monitoring and record keeping protocols.

MBNMS regulations prohibit the discharge of oily wastes from bilge pumping at any concentration, however this prohibition is not widely known and enforcement may be challenging.

Ballast Water
Cruise ships take in millions of gallons of ballast water, in order to stabilize the vessel for safe and efficient operation. During the process they take in thousands of species of marine organisms, including various types of larvae, fish eggs, and microorganisms. The water is often drawn in from coastal waters in one area, and discharged at another location. This process has

led to the introduction of invasive species, which disrupt marine ecosystems, and cost the U.S. billions of dollars per year.

Ballast water operations are currently regulated by the state of California by the Ballast Water Management for Control of Nonindigenous Species Act. The Act requires vessels to exchange ballast water, in waters beyond 200 nautical miles from land and at least 2000 meters deep, or to retain all ballast water. However, no similar regulations yet address vessels involved only in coastal transits.

Hazardous Materials
Hazardous wastes produced on cruise ships include by-products of dry cleaning and photo processing operations, paints and solvents, batteries, fluorescent light bulbs containing mercury, and wastes from print shops. A typical ship produces an estimated 110 gallons of photo processing chemicals, five gallons of dry cleaning wastes, and ten gallons of used paints per week. These substances can be toxic or carcinogenic to marine life.

The U.S. Resource Conservation and Recovery Act (RCRA) imposes management requirements on cruise ships and other vessels that generate or transport hazardous waste and requires that hazardous materials be offloaded to land based treatment or disposal facilities.

Solid wastes
Solid wastes generated by cruise ships include large volumes of food waste, cans, glass, wood, cardboard, paper, and plastic. Plastic debris can be ingested or cause entanglement to marine life including marine mammals, seabirds, and sea turtle. In some cases the wastes are incinerated on the vessel and the ash is discharged at sea; other wastes are disposed of on shore or recycled. A typical cruise ship generates eight tons of solid waste per week.

The discharge of solid wastes is regulated under APPS and CWA. The Marine Plastic Pollution and Control Act regulates the disposal of plastics and garbage pursuant to ANNEX V of MARPOL. Under these regulations the disposal of plastics is prohibited in any waters, and floating dunnage and packing materials are prohibited in navigable water within twenty-five nautical miles from land. Other garbage including paper, glass, rags, metal, and similar materials is prohibited within twelve nautical miles from shore (unless macerated, in which case it can be disposed of beyond land).

Cruise line industry violations
The cruise line industry historically has had a relatively poor record regarding environmental violations. The vast majority of cruise ships are foreign flagged (mainly Liberia and Panama). According to a report published by the Government Accounting Office, there were eighty-seven confirmed illegal discharge cases from cruise ships between 1992 and 1998 in U.S. waters. Eighty-one of these cases involved oil, and six involved plastic or garbage. Seventy-five percent of these violations were accidental (human or mechanical error).

Cruise Line Industry Initiatives
A number of cruise lines have made significant improvements to address environmental concerns in recent years. The International Council of Cruise Lines (ICCL) is the main trade association

that represents 16 of the world's largest cruise lines (95% N American Market, 85% worldwide), and serves as a consultative organization to the International Maritime Organization. ICCL lines reported a reduction in waste by more than 50% between 1992 and 2002. In 2001, the Cruise Industry Waste Management Practices and Procedures document was adopted by ICCL members, and is now a mandatory condition for membership in the organization. Among the principles in this document are: full compliance with international laws and regulations; maintenance of cooperative relationships with U.S. and international regulatory agencies; design, construction, and operation of more environmentally sensitive vessels; utilization of new technologies; adoption of strategies for conserving resources through purchasing and product management; minimization of waste and increasing reuse and recycling; optimization of energy use/efficiency; management of discharges, and; education of guests and staff. These standards are then placed into the Safety Management System for each vessel. Several cruise lines have adopted even more stringent voluntary measures, including Celebrity cruises, whose vessels are required by corporate policy to discharge of black water no closer than 12 miles from shore.

Within the Sanctuary, three cruise lines which visited in 2002 voluntarily adopted a no discharge policy within the Sanctuary, following numerous conversations and meetings with Sanctuary staff, State and local government officials and environmental organizations. While the Sanctuary welcomed these voluntary agreements, one of the cruise lines subsequently broke the agreement by discharging within Sanctuary boundaries upon its departure from Monterey. Critics argue that these voluntary industry initiatives are self regulated, not taken seriously by cruise ship operators, and non-enforceable.

Recent Legislation and Initiatives

The State of California has recently devoted increased attention to cruise ships, and pursuant to AB 2746 created an inter-agency task force in 2001 to evaluate environmental practices and waste streams of cruise ships. The group was also charged with evaluating the adequacy of existing regulations regarding large passenger vessels, and is required to produce a report detailing their findings by June 1, 2003. AB 2746 also requires owners or operators of vessels to submit a quarterly report to the State Water Resources Control Board that details any discharge of gray water or sewage in state water. Several proposed bills addressing cruise ships are currently being considered: AB 121 would prohibit cruise ships from discharging sewage, oily bilge water, and ballast water into state waters, and the four National Marine Sanctuaries of the state (Channel Islands NMS, Monterey Bay NMS, Gulf of the Farallones NMS, and Cordell Bank NMS); AB 906 would prohibit release of graywater and hazardous waste in state waters, and National Marine Sanctuaries of the State; and AB 433 would revise current California regulations for ballast water and control of non indigenous species.

Other states have also recently addressed this issue. Alaska enacted a law in 2001 which established the Commercial Passenger Vessel Environmental Compliance Program. Federal legislation was also passed that established standards for discharge of black water and gray water in State waters for large passenger vessels with more than 500 passengers. The law gives cruise ship operators the option of either holding all wastewater, discharging it through a type II MSD beyond one nautical mile from shore and at a speed greater than 6 knots, or continuously discharging if the wastewater has been treated by an advanced treatment system certified by the USCG.

In the State of Florida, the state waters within the Florida Keys National Marine Sanctuary (FKNMS) were designated as a no discharge zone by the EPA under Section 312 of the Clean Water Act, making it illegal for any vessel to discharge sewage. The FKNMS is also currently pursuing a prohibition against discharge of sewage from any vessel, within Federal and state waters of the Sanctuary, as part of the regulatory changes of their Management Plan Review. This prohibition would be a FKNMS regulation rather than an EPA no discharge zone.

Action Plan Components

As noted above, a wide array of pollutants may be discharged in large volumes from cruise ships. Although there are a number of existing laws and regulations that partly address this issue, there is a need for a more comprehensive prohibition on cruise ship discharges within the MBNMS, along with improved coordination and outreach to the industry, monitoring and enforcement. These will be developed further as the main components of the JMPR Cruise Ship Action Plan.

Strategy CS-1: Harmful Discharge Prohibition

Strategy Description:
MBNMS staff will characterize the issue and develop a prohibition on harmful discharges for cruise ships operating in the MBNMS. Based on a recommendation by the MBNMS SAC, the MBNMS will consider pursuing a regulatory prohibition against harmful discharges from cruise ships.

Activity 1.1: Compile Additional Background Information Needed to Support Regulation Including On-Board Disposal Practices and Impacts to Resources From:

- Discharges: Black water, gray water, bilge water, hazardous wastes, solid wastes, desalination effluent
- Ballast water

Activity 1.2: Consult and Collaborate with EPA to Determine Alternatives for Regulatory Prohibitions

Activity 1.3: Develop a Prohibition on all "Harmful Discharges" from Cruise Ships to Sanctuary Waters, Except Engine Cooling Water (including treated bilge water, gray water, black water, ballast water, hazardous wastes, solid wastes, desalination brine)

Activity 1.3: Define the Size or Carrying Capacity of the Passenger Vessels to Which the Regulation Would Apply

Activity 1.4: Define What Level of Treatment and Monitoring Would be Necessary to Allow for an Exception to the No Discharge Prohibition, e.g. for Cruise Ships Which are Adopting Advanced Treatment Systems for Sewage Discharges

Activity 1.5: Review and Consider Ultimate Language in any New State Legislation That is Passed to Ensure That MBNMS Regulation Complements and Builds on State Efforts

Status: Phase 1
Potential Partners: SWRCB, RWQCB, State Lands Commission, USCG, Ocean Conservancy

Strategy CS-2: Outreach and Coordination

Strategy Description
MBNMS staff will develop a system to ensure that cruise line industry representatives, cruise ship operators and crew, regulatory agencies, and other relevant parties are cognizant of the Sanctuary's existing and revised policies, if adopted, regarding cruise ship discharges. Staff will also conduct outreach, aimed at educating cruise ship operators and crew about the MBNMS and its resources, potential impacts from vessel operations, and measures that can be taken to minimize these impacts.

Activity 2.1: Develop and Implement a Plan for Outreach on the New Regulation Aimed at Cruise Line Industry, Regulatory Agencies, and General Public

Activity 2.2: Develop and Implement a Plan for Improved Tracking of Potential Cruise Ship Visits and Early Communication with Cruise Line Representatives

Activity 2.3: Develop Protocols for MBNMS Communication with Cruise Line Companies, which may Include:

- Checklist of items to discuss with cruise ship companies to include anchoring guidelines, adherence to vessel traffic lanes, Sanctuary boundaries, etc.
- Contact list for cruise company representatives, and other regulatory agencies

Activity 2.4: Ensure Cruise Line Management, Ship Operators, and Crew Are Educated About the MBNMS, and Potential Impacts to Marine Resources by Cruise Ships

Activity 2.5: Provide Information on How They Can Minimize These Impacts Through Proper Stewardship And Use of "Best Management Practices" Etc.

Status: Phase 1
Potential Partners: City of Monterey, SWRCB, RWQCB, cruise ship industry

Strategy CS-3: Enforcement and Monitoring Program

Strategy Description
MBNMS staff, in collaboration with partners, will develop and implement enforcement and monitoring programs, and protocols for reporting by cruise ships.

Activity 3.1: Develop Standard Requirements and Protocols for Reporting to Include:

- Reporting in case of discharge (emergency contacts)
- Standard reporting requirements including standard documents that would be required from all cruise ships visiting MBNMS (vessel logs, printouts from holding tanks, etc.)

Activity 3.2: Develop and Implement a Monitoring Program in Collaboration with Partners

A. Investigate and evaluate potential monitoring protocols and determine feasibility
B. Identify partners and funding sources, including industry fees

Activity 3.3: Develop and Implement an Enforcement Program, in Collaboration with Partners

A. Evaluate and establish effective enforcement practices to assure compliance
B. Provide sufficient enforcement resources to investigate potential violations
C. Develop collaborative inspection programs with USCG to inspect onboard discharge records and ships systems for compliance

Status: Phase 1
Potential Partners: SWRCB, RWQCB, USCG, City of Monterey, cruise ship industry

Strategy CS-4: Cruise Ship Passenger Education Program

Strategy Description
Through partnerships with the cruise line industry and local tour operators, MBNMS staff will develop a program to educate cruise ship passengers about the MBNMS and its resources.

Activity 4.1: Investigate Partnerships with Cruise Line Industry regarding MBNMS Outreach Materials and Opportunities, including

A. Production of Customized Materials – Print and Video
B. Distribution of Education and Outreach Materials
C. Onboard Presentation or Videos about the MBNMS and its Resources

Activity 4.2: Collaborate with Sightseeing Tour Operators, to Incorporate Sanctuary Information and Messages to Shore Based Tourists

Status: Phase 1
Potential Partners: City of Monterey, cruise ship industry, tourist industry, environmental organizations

Revise Water Quality Memorandum of Agreement Action Plan

Goal Statement
The goal of the MOA update is to incorporate the implementation of the WQPP Action Plans and new water quality programs of the signatory agencies, address agency roles in furthering implementation, and where necessary improve the interagency permit authorization process.

Introduction
The National Oceanic and Atmospheric Administration (NOAA) developed a Water Quality Management Memorandum of Agreement (MOA) with key agencies as part of the 1992 MBNMS Management Plan. This document states, "The purpose of this Memorandum of Agreement (MOA) is to provide an ecosystem based water quality management process that integrates the mandates and expertise of existing coastal and ocean resource managers and protects the nationally significant resources, qualities and compatible uses of the Monterey Bay National Marine Sanctuary (Sanctuary or MBNMS)."

In addition to affirming regulatory and management roles of the individual signatory agencies, the MOA required the agencies to work together on the development of the Sanctuary's Water Quality Protection Program (WQPP). Today, the WQPP is a partnership of 25 federal, state and local agencies, public and private groups, dedicated to protecting and enhancing water quality in the Sanctuary and its watersheds.

The signatories to the 1992 MOA include NOAA, the U.S. Environmental Protection Agency (EPA), California Environmental Protection Agency (Cal EPA), California State Water Resources Control Board (SWRCB), San Francisco Bay and Central Coast Regional Water Quality Control Boards (RWQCBs #2 & #3), the California Coastal Commission (CCC), and the Association of Monterey Bay Area Governments (AMBAG). The MOA outlines agency roles and responsibilities, procedures for decision-making, and agreements for coordination of management, research and monitoring efforts.

Numerous activities have taken place since 1992, which need to be reflected in the MOA, such as development of five WQPP plans, the State's Nonpoint Source Control Program, and regional monitoring efforts. The MOA needs to be updated to address implementation of these new plans, strengthen coordination with new programs of the signatory agencies and other key partners, and make minor revisions in the interagency permit review process for point sources of pollution.

Summary of the Existing MOA
The MOA begins with a discussion of the statutory authority and jurisdictional boundaries for each signatory agency, and includes a narrative description of how this authority is implemented. The document then describes the scope of the MOA, which applies to the following permits, plans, research, and monitoring efforts within all California waters:

- National Pollutant Discharge Elimination System (NPDES) permits (which include stormwater associated with industrial activity and stormwater from urban areas) issued under Section 13377 of the California Water Code;

- Waste Discharge Requirements (WDR) issued under Section 13263 of the California Water Code;
- California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan, relevant Basin Plans, and CWA 208 Plans;
- Non-Point Source Pollution Planning and Control Measures including Management Plans prepared under Sections 319 and 208 of the CWA and under Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990; and
- Research and Monitoring toward the development of a Sanctuary Water Quality Protection Program, (outlined in the MOA).

The MOA specifies how the Sanctuary certification process for existing permits and review process for new or revised (including renewal) permits will be administered within State waters with the Sanctuary in coordination with the State permit program.

Existing Plans
The MOA states that NOAA will review and provide comment on the California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan and Regional Board Basin Plans during the regularly scheduled review period. All parties agreed to make every effort to build upon existing regional, local, and State water quality control plans.

Non-Point Source Pollution
The MOA recognized the significance of non-point source (NPS) pollution to the health of the Monterey Bay ecosystem, and signatories agreed to focus pertinent ongoing NPS pollution efforts such as CWA 205(j) studies, municipal and industrial stormwater permitting (Section 402, CWA), 208 plans, 319 programs, and NOAA water quality research efforts to develop adequate prevention and management measures for protection of the Sanctuary. The signatories agreed to work together to incorporate those controls and measures determined necessary to protect the Sanctuary into the California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan and appropriate Basin Plans once adequate prevention controls and management measures have been determined.

New and Revised Permits
No additional applications will be required by NOAA, however NOAA may seek, through the Board, additional information from the applicants in accordance with State law. Regional Boards will draft permits according to the schedule submitted to NOAA, incorporating all criteria which the Regional Board determines to be applicable (e.g., State Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan, Basin Plans, Federal regulations) as agreed upon in the 1989 National Pollutant Discharge Elimination System (NPDES) MOA between the U.S. EPA and the SWRCB. Regional Boards will mail draft permits to NOAA and all other concerned agencies for comment 90 days before scheduled adoption of the draft permit by the Regional Board. No permit may be renewed or otherwise issued allowing the discharge of primary treated sewage within the Sanctuary.

NOAA will review and comment on any draft new or revised permits and EIRs/EISs during the publicly noticed comment period. NOAA will review draft permits, monitoring summaries, and any other applicable data, and provide comments to the Regional Board no later than 30 days

prior to the scheduled date of Regional Board adoption of the permit. The MOA states that the Regional Board shall consider and address all comments and shall modify the proposed permit to incorporate those comments with which the Regional Board agrees and shall prepare a written response to each NOAA comment that is not accommodated. Permits may then be judged valid and certified by NOAA, or NOAA may refer disputed permits to an appeal procedure. Finally, no permit was to be issued allowing the disposal of dredge material within the Sanctuary other than at sites designated as of the effective date of Sanctuary designation.

Integration and Coordination of Research and Monitoring Efforts
Each MOA signatory agreed to conduct, coordinate, and integrate any joint research, monitoring, and permit review oversight. The results of these efforts will be used to develop a more specific water quality management plan and to provide a higher degree of resource protection for the Sanctuary.

Initial Decision Making Procedures
The MOA describes a procedure for permit review whereby the Sanctuary may comment on any new or revised permit application. This system was meant to allow adequate opportunity for the Sanctuary to review and certify State permits, without creating a duplicative process of separate permit applications. The MOA indicated that permittees should send a copy of their state permit application directly to the Sanctuary. In practice, the Sanctuary has generally not been receiving these applications directly, and instead has relied upon RWQCB staff reports, the attached permits and their associated comment periods to recommend any modifications to permits that it felt could impact the Sanctuary.

Procedures for Referral – Process of Elevation
Since the inception of the MOA, concerns of all signatory agencies have been addressed at the initial decision-making level. However, the MOA does provide for a process for elevation should agreement not be reached at this level. Should NOAA feel that a RWQCB permit does not adequately act to relieve the threat of significant injury it has the option to file an appeal with the SWRCB. The SWRCB can confirm, amend, or overturn the decision of the RWQCB. Should NOAA disagree with the decision on appeal of the SWRCB, it has the option to file an appeal with the MBNMS Joint Review Board (JRB), which consists of an Administrator of NOAA and the Secretary of the California EPA.

Water Quality Protection Program
The MOA states, “All signatory agencies agree to work together to develop a comprehensive water quality protection program for the Sanctuary.” The purpose of the this program was described to be to:

- Recommend priority corrective actions and compliance schedules addressing point and non-point sources of pollution to restore and maintain the chemical, physical, and biological integrity of the Sanctuary, including restoration and maintenance of the resources, qualities, and compatible uses of the Sanctuary; and
- Assign responsibilities for the implementation of the program among the Governor, the Secretary of Commerce, and the Administrator of U.S. EPA or designees in accordance with applicable Federal and State laws.

- The program shall under applicable Federal and state laws provide for measures to achieve the purposes described above including:
- Adoption or revision, under applicable Federal and State laws, by the State and the Administrator of applicable water quality standards for the Sanctuary, based on water quality criteria which may utilize biological monitoring or assessment methods, to assure protection and restoration of the resources and qualities of the Sanctuary;
- Adoption under applicable Federal and State laws of enforceable pollution control measures (including water quality-based effluent limitations and best management practices) and methods to eliminate or reduce pollution from point and non-point sources;
- Establishment of a comprehensive water quality monitoring program to (1) determine the sources of pollution causing or contributing to existing or anticipated pollution problems in the Sanctuary, (ii) evaluate the effectiveness of efforts to reduce or eliminate those sources of pollution, and (iii) evaluate progress toward achieving and maintaining water quality standards and toward protecting and restoring any degraded areas and living marine resources of the Sanctuary;
- Provision of adequate opportunity for public participation in all aspects of developing and implementing the program;
- Identification of funding for implementation of the program, including appropriate Federal and State cost sharing arrangements; and
- Provision to ensure compliance with the program consistent with applicable Federal and State laws.

The MOA was signed by:

- Gertrude M. Coxe, Director, Office of Ocean and Coastal Resource Management, NOAA
- Harry Seraydarian, Director, Office of Water, Region IX, U.S. EPA
- James Strock, Secretary, California EPA
- Walt Pettit, Executive Director, State Water Resources Control Board
- Steven Ritchie, Executive Officer, San Francisco RWQCB
- William Leonard, Executive Officer, Central Coast RWQCB
- Peter Douglas, Executive Director, CCC
- Nicolas Papadakis, Executive Director, AMBAG

Strategy MOA-1: Outreach to Signatory Agencies

Strategy Description
Conduct outreach to signatory agencies to provide an update on the WQPP and MOA revision

Activity 1.1: Present Sanctuary WQPP and MOA Overview to Signatory Agency Executive Staff
Many of the original signatories to the MOA are no longer with their respective agencies. The MOA revision process represents an opportunity to update agency management on the WQPP, discuss the role of their agency in the MOA, and the need for coordination and support between agencies. These initial meetings will provide a platform of support and direction to build upon during meetings with the staff of each agency.

Activity 2.2: Conduct Follow-Up Meetings with Signatory Agency Staff to Outline MOA Revisions
With the support of the signatory agency executive staff, meet with appropriate departmental staff from each agency to outline necessary revisions.

Strategy MOA-2: Outline of Revised MOA

Strategy Description
Drawing on MBNMS staff and input from initial agency meetings, develop an outline of the types of revisions to be addressed in the MOA, including the categories below.

Activity 2.1: Incorporate WQPP Action Plans into the MOA
The WQPP has used a collaborative approach involving key stakeholders to develop four detailed action plans entitled Implementing Solutions to Urban Runoff; Regional Monitoring, Data Access, and Interagency Coordination; Marinas and Boating; and Agriculture and Rural Lands. A fifth action plan addressing the issues of beach closures and microbial contamination is currently being developed. Implementation of these action plans, described in detail elsewhere in the JMPR, is crucial to meeting the purpose of the MOA. The MOA should be revised to reflect agreements on the need to work jointly to implement these plans, how to coordinate staffing and funding, and the need to work with additional key partners who are not signatory agencies.

Activity 2.2: Incorporate New Programs of Signatory Agencies into the MOA
Many of the signatory agencies have revised or developed new plans, programs, or permit types that should be described in the MOA such as the State's Nonpoint Source Control Program, NPDES Phase II permits and TMDLs.

Activity 2.3: Incorporate Linkages between WQPP Plans and Signatory Agency Programs, Plans and Permits
The updated MOA should include recommendations for coordination and leveraging of implementation efforts between WQPP plans and existing and new programs of partner agencies to meet common goals.

Activity 2.4: Incorporate Funding Incentives into the Draft-Revised MOA
Adequate funding is critical for the implementation of the WQPP action plans. The MOA should identify processes to improve the ability of Sanctuary partners to obtain funding to carry out action plan strategies. Such methods may include identification of WQPP plans in Requests for Proposals, improved coordination between granting agencies, or dedicated funding mechanisms.

Activity 2.5: Review and Recommend Improvements to Permit Authorization Process
The MOA revision process should include a review of the timelines, interagency notification procedures and decision-making process for initial permit applications, and a review of the procedures for elevated referrals through the State Water Resources Control Board.

Strategy MOA-3: Draft Document and Coordinate with Agencies on Final Approvals

Strategy Description
Draft, circulate, and obtain approvals on the revised MOA

Activity 3.1: Meet with signatories to develop modifications
Following distribution of an outline of revisions, conduct a joint meeting with all the signatory agencies to address remaining gaps and necessary modifications.

Activity 3.2: Draft and circulate MOA revisions to agencies
Draft the revised MOA and circulate to agencies for comment. This step may require multiple revisions and distributions. Upon receiving final staff input from each agency, Sanctuary staff will prepare the final-revised MOA.

Activity 3.3: Obtain legal approvals
Given the nature of the MOA, the appropriate legal councils from each signatory agency will need to review and approve of the final-revised MOA.

Activity 3.4: Obtain Final Agency Signatures
After obtaining approval from the appropriate legal councils, the Revised MOA will be circulated for signature between each of the agencies.

Status: Phase 1 (as part of JMPR process)
Potential Partners: MOA signatories

Water Quality Protection Program Implementation Action Plan

Goal Statement
To reduce contaminanation from nonpoint source pollution in MBNMS and its watersheds.

MBNMS Staff Contact

Chris Coburn	Water Quality Protection Program Director

MBNMS Staff

Holly Price	Resource Protection Coordinator
Bridget Hoover	Citizens Monitoring Network Coordinator
Katie Siegler	Agricultural Water Quality Coordinator
Lisa Emanuelson	Resource Issue Education Specialist

Working Group Members

Craig J. Wilson	State Water Resources Control Board
Daniel Mountjoy	National Resource Conservation Service
Dawn Mathes	CCCC Farm Bureau
Dean Peterson	San Mateo County
Deborah Johnston	California Department of Fish and Game
Donna Bradford	Santa Cruz County
Fleur O'Neill	Save our Shores
Fred Watson	Watershed Institute, CSUMB
John Ricker	Santa Cruz County Environmental Health
Kaitilin Gaffney	The Ocean Conservancy
Karen Worcester	Regional Water Quality Control Board
Mark Silberstein	Elkhorn Slough
Robert Ketley	City of Watsonville
Ross Clark	California Coastal Commission

Introduction
The Sanctuary is adjacent to nearly 300 miles of California's Coastline and receives runoff from eleven major watershed areas. The 7000 square miles of land uses in the adjacent watersheds range from forest and grazing lands to heavily agricultural and urbanized areas. As rainfall or irrigation water passes over the different land uses within the watershed it can pick up a variety of pollutants, which find their way into streams, rivers, wetlands, harbors, and eventually into the Sanctuary. Offshore areas of the Sanctuary are in relatively good condition, but nearshore coastal areas, harbors, lagoons, estuaries and tributaries show a number of problems including elevated levels of nitrates, sediments, persistent pesticides, metals, bacteria, pathogens, detergents, and oils. These contaminants can have a variety of biological impacts including bioaccumulation, reduced recruitment of anadramous species, algal blooms, mortality due to toxicity, transfer of pathogens, and interference with recreational uses of the Sanctuary.

During the designation of the Sanctuary in 1992, eight key water quality agencies within the Sanctuary region entered into a Memorandum of Agreement (MOA) to provide an ecosystem-based water quality management process that integrates the mandates and expertise of existing coastal and ocean resource managers and protects the nationally significant resources, qualities and compatible uses of the Sanctuary. This MOA led to the development of the Sanctuary's Water Quality Protection Program (WQPP). Today, the WQPP is a partnership of 25 federal, state and local agencies, public and private groups, dedicated to protecting and enhancing water quality in the Sanctuary and its watersheds.

This partnership of MOA signatories, additional public agencies, non-governmental and private organizations are working as members of the Water Quality Protection Program Committee. This committee oversaw the development of four action plans entitled Implementing Solutions to Urban Runoff; Regional Monitoring, Data Access, and Interagency Coordination; Marinas and Boating; and Agriculture and Rural Lands. Many committee members have been partners in initial implementation efforts along with a wide variety of stakeholders in the community including federal, state, and local agencies, businesses, landowners, environmental groups, and the general public.

Program Updates
Rather than addressing new topics, this action plan incorporates recommendations of the existing WQPP plans that have been created since the Sanctuary was designated, and recommends ongoing or additional steps for implementation. Existing WQPP plans include:

- Implementing Solutions to Urban Runoff
- Regional Monitoring, Data Access, and Interagency Coordination
- Marinas and Boating
- Agriculture and Rural Lands.

These original action plans are organized in a format similar to the other JMPR action plans by Strategy and Steps (here called Activities), with each Activity containing multiple components. Despite limitations on funding dedicated to implementation and staff vacancies during recent years, there has been substantial implementation of a number of strategies, as well as many strategies that have been partially implemented. In many of these cases of partial implementation, implementation has occurred in some geographic areas or at some times, but has not been widespread or regular throughout the region. A few of the strategies have already been completed or are fully implemented and ongoing, and a few strategies have not been initiated at all.

The program has been quite successful in leveraging the plans into funding from outside sources, often through grant proposals, and in the case of the Agriculture and Rural Lands plan, through a Congressional allocation from the USDA budget to one of our key partner agencies. Although this outside funding has been essential for program implementation, a disadvantage of this approach has been that it is quite time consuming to pursue, obtain and administer such outside funding. Grants are generally quite limited in scope and duration and so can lead to a rather fragmented approach.

A general overview of the number of strategies and activities and the level of implementation is provided in the table below.

Water Quality Protection Program: Action Plan Implementation

Action Plan	Number of Strategies in Full WQPP Plans	Total Number of Activities in Full WQPP Plans	Number of Strategies Implemented			
			Completed or Ongoing	Substantial Implemen-tation	Partial Implemen-tation	Not Initiated
I. Implementing Solutions to Urban Runoff	7	37	0	3	4	0
II. Regional Monitoring, Data Access and Interagency Coordination	3	25	0	2	1	0
III. Marinas and Boating	7	50	1	1	2	3
IV. Agriculture and Rural Lands	24	90	1	3	14	6
Total WQPP	**41**	**202**	**2**	**9**	**23**	**7**

The WQPP Committee used the JMPR process to review the WQPP and its individual action plans, to determine what has been implemented, what the barriers to full implementation have been, and what should be priorities as the program moves forward. Following below are each of the four existing action plans broken down into their component strategies. The implementation of the steps in the original plans is briefly summarized here in the table and text under each strategy. This implementation update is followed by descriptions of the Activities that will be ongoing or next steps for that Strategy, along with prioritizations identified as Phase 1, II or III. The strategies and activities described here are short summaries of the detailed recommendations in the four original WQPP action plans that total 250 pages.

ACTION PLAN I: IMPLEMENTING SOLUTIONS TO URBAN RUNOFF

Urban runoff is a significant problem in the Sanctuary's watersheds that can benefit from a coordinated regional approach towards education, training, and management. The constituents of concern associated with urban runoff include petroleum hydrocarbons, metals, sediments, detergents, nutrients, pesticides, and organics. The WQPP Urban Runoff Plan was developed in 1996 in collaboration with the WQPP committee, many of the region's public works representatives and other stakeholders. It describes seven priority strategies for addressing the problems associated with urban runoff in the region.

Strategy WQPP-1: Public Education and Outreach

The objective of this strategy in the original plan was to review existing educational programs and materials, and to build a framework that would develop a comprehensive regional education and outreach program focused on urban runoff, water quality, and watershed issues. This was to be accomplished by coordinating and building on education efforts that address the causes of urban runoff problems, its effects on habitats and resources, and promotion of measures that reduce pollutants in runoff.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Review Existing Programs and Materials to Identify Best Tools	Initial review completed, needs update
Establish a Framework for the Program	Substantial implementation, but intermittent
Develop Supporting Materials	Substantial implementation
Establish Methods for Distributing Information	Partial implementation

The MBNMS developed an initial framework that identified specific target audiences, prioritized geographic areas, and identified the tools, distribution methods, and existing outreach programs to incorporate into the program. Numerous high quality educational materials and programs have been developed or modified to implement this strategy. Many of these materials are available in bilingual formats.

- "Dirty Word" TM radio spots – focus on urban runoff targeting general public
- "Dirty Word" TM PSA's for television – focus on urban runoff targeting general public
- "Storm Drains to Sanctuaries" – PSA for television
- Bus ad / movie slide – addressing storm drains
- Roving watershed and storm drain models
- Storm drain poster
- Monterey Bay Begins on Your Street brochure
- Urban Watch program brochure
- "Be Kind to Animals" – Coloring book for children
- WQPP Brochure
- A Citizens Guide to Clean Water

Written materials have been distributed through a variety of venues, including businesses, schools, at public events, and teacher training workshops. Radio ad campaigns have provided multiple exposures in past years, but now lack funding for ongoing presentations. Outreach programs have included a door-to-door campaign in the City of Watsonville, incorporation of water quality lessons into teacher training workshops, and hands-on models, which are used to demonstrate polluted runoff at public events. Outreach has also included water quality presentations to local and state governments, and to various conferences, workshops and classes. Although radio and TV reaches audiences throughout the region, much of the focus of the other types of outreach has been in a few key cities that have been initial partners in the effort, including Monterey, Pacific Grove, and Watsonville.

Strategy Description
Although much has been implemented under this strategy, there has not been a consistent program over time or across the cities in the region due to the variable grant-funded nature of activities and staff turnover. Stable implementation of the framework is needed for an educational program that continuously evaluates and expands outreach and addresses the many geographic areas and populations that have not been a focus of the program to date.

Activity 1.1: Update and Reprint Existing Educational Materials as Needed

Activity 1.2: Broaden Distribution of Existing Outreach Materials and Programs
Develop outreach distribution mechanisms and programs that are more consistent over time and throughout the region, repeating outreach as needed in existing pilot areas and expanding to coastal cities and constituents not yet reached and inland cities like Salinas.

Activity 1.3: Develop a Stable Funding Source and Infrastructure with Partners to Facilitate Ongoing Distribution and Programs
This should include coordinating and pooling resources with cities required to develop education programs under their NPDES Phase II permits.

Activity 1.4: Expand Outreach to the Hispanic Population in Coordination with MERITO

Status: Phase 1
Potential Partners: Cities and counties, MRWPCA, schools, business organizations

Strategy WQPP-2: Technical Training

The main objective of this strategy in the original plan was to develop voluntary technical training material and programs for public works and planning staff, small businesses/trades, and construction companies on methods to prevent urban runoff pollution.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Evaluate Existing Training Programs, Which Could Be Adopted or Modified	Completed, Needs Updating
Assemble Materials / Enlist Instructors	Completed, Needs Updating
Advertise / Conduct Training in Two Cities	Completed
Conduct Regional Training Program	Substantial Implementation
Evaluate Effectiveness of Training	Partial Implementation
Schedule Ongoing Series of Workshops	Partial Implementation
Establish a Technical Support Network	Not Initiated

Substantial implementation of the technical training strategy occurred in the initial years after plan completion, although activity has reduced in recent years. Implementation on a regional level included co-hosting of 5 training workshops for public works and planning staff focused on various technical elements of a Model Urban Runoff Program (see below). The Sanctuary also conducted technical training on-site with 7 public works departments of individual municipalities via a contractor who addressed specific best management practices related to urban runoff and coliform contamination.

Training for the business community has been partly implemented through development and partial distribution of a variety of technical training materials, including:

- Restaurant outreach survey to assess understanding of issue and current practices
- Restaurant outreach training video on best management practices called “Make The Connection”
- Restaurant Best Management Practices poster
- Automotive Best Management Practices poster

These materials for businesses have been primarily distributed through outreach programs in the cities of Monterey and Pacific Grove, utilizing funding from the cities.

Strategy Description
Similar to the education strategy, although substantial implementation has occurred, the trainings have not been consistent in time or covered sufficient geographic areas or target audiences. The

training program should be an ongoing one due to staff turnover in target organizations, the need to remind and provide updates to ongoing staff, and to reach new audiences.

Activity 2.1: Update and Expand Training Materials
This should include reviewing past training materials for public works departments to summarize new management measures and regulations. Additional training modules should be included to address planning department staff, supervisors of construction and maintenance crews, businesses, and trades and agency personnel handling hazardous materials.

Activity 2.2: Continue Regional and On-site Urban Training Workshops
This should include contacting municipal and county department heads and trade associations to develop target audiences. The Sanctuary should also continue to perform on-site municipal training sessions and modules to reach those staff who are actually implementing the work and who generally are not reached by regional workshops.

Activity 2.3: Develop and Conduct Training Workshops with Developers
Local planning department staff are often overburdened and do not have the time to thoroughly review development plans for inclusion of stormwater / urban runoff controls. To assist them in reducing water quality impacts, workshops and trainings should be conducted with the developers and project designers to raise their awareness of stormwater / urban runoff controls that can be included at the onset of the project, rather than relying solely on planners.

Status: Phase 1
Potential Partners: CCC, cities and counties, RWQCBs

Strategy WQPP-3: Regional Urban Runoff Management

The objective of this strategy in the original plan was to initiate a collaborative effort among municipal, county, and RWQCB staff to develop and implement area-wide urban runoff management programs.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Develop a Model Municipal Program, Which Provides a Comprehensive Guide to Urban Runoff Management	Completed
Evaluate Existing Regional Urban Runoff Programs for Lessons Learned	Completed
Modify Stormwater Task Force Goals	Not Initiated
Select a Pilot Area For an Urban Runoff Program	Complete
Develop a Formal Program Structure For Regional Effort	Partial Implementation
Develop a Plan For Area-Wide Program	Partial Implementation
Implement the Pilot Program	Completed
Modify Program and Implement in Other Areas	Partial Implementation

Initial implementation of this strategy involved the development of a Model Urban Runoff Program (MURP), in collaboration with the cities of Monterey and Santa Cruz, the Sanctuary, CCC and the RWQCB. The MURP is a comprehensive guidebook that includes model ordinance revisions, municipal best management practices, illicit discharge detection programs, and recommendations for organizing, funding and monitoring the program. In addition to development of the guidebook, initial implementation of MURP was accomplished in Monterey, Santa Cruz and the City of Watsonville via grant funding. The guidebook has been distributed to all local jurisdictions and numerous trainings have been conducted. Several additional cities have begun adopting the recommendations.

A second key element of this strategy, the development of a formal regional approach to urban runoff, has been partly initiated by local jurisdictions. In Monterey County, Monterey Regional Water Pollution Control Agency is serving as a regional coordinator and permit holder for a coalition of municipalities on the Monterey Peninsula to address urban runoff under NPDES Phase II regulations. A regional approach is also being considered in Santa Cruz County but has not yet been formalized.

Strategy Description
The strategies contained in the MURP are directly transferable to jurisdictions developing their stormwater management programs required under their new Phase II permits. Given the fiscal situation of many jurisdictions there will be a need to reduce development costs and to utilize existing programs and materials. In addition, there is an ongoing need to encourage coordination among jurisdications to develop regional programs in additional areas.

Activity 3.1: Coordinate with Individual Jurisdictions to Implement Local Stormwater Programs

The Sanctuary should coordinate with individual local jurisdictions in the development and implementation of their stormwater management programs to provide materials developed under the MURP, and assist in implementation of the technical training, monitoring and educational elements of addressing urban runoff management.

Activity 3.2: Facilitate the Development of Regional Stormwater Programs

The Sanctuary should coordinate with additional jurisdictions to encourage their development of coordinated regional approaches to stormwater and pooling of their resources to address urban runoff issues. This should include encouraging the development of multijurisdictional NPDES permit programs such as those developed for the Monterey Peninsula. The Sanctuary should also continue to collaborate with the Stormwater Task Force as a platform for information sharing and coordination of Phase II NPDES programs around Monterey Bay, and with other entities such as MRWPCA in their regional stormwater programs.

Status: Phase 1
Potential Partners: cities and counties, MRWPCA, RWQCBs, CCC

Strategy WQPP-4: Structural/Non-structural Controls

The objective of this strategy in the original plan was to develop demonstration projects and conduct briefings with municipalities, counties and special districts to promote the use of Best Management Practices (BMPs). Additional activities sought to initiate regional cooperation for prioritizing sites and adopting such practices.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Select Pilot Project/Solicit Participation	Completed
Plan, Implement, and Evaluate Pilot Project	Completed
Develop/Distribute BMB Guidelines	Not Initiated
Expand Implementation	Not Initiated

Direct Sanctuary involvement in implementation of this strategy has been limited to a pilot project and study conducted jointly with the City of Monterey to test the utility of oil and sediment/water separators for treating runoff from parking lots, which uncovered numerous technical challenges in the use of such devices. Identification of alternative types and locations for demonstration projects, and briefings to local government have not been conducted. However, the CCC has initiated numerous structural control projects through its permits.

Strategy Description
The use of Best Management Practices should be promoted including structural and nonstructural controls to improve water quality.

Activity 4.1: Promote structural and nonstructural controls via technical training

Status: Phase 1

Activity 4.2: Track and comment on major local projects and plans to encourage inclusion of structural and nonstructural controls

Status: Ongoing

Activity 4.3: Pursue additional pilot projects with local jurisdictions

Status: Phase 2
Potential Partners: cities and counties, CCC, developers

Strategy WQPP-5: Sedimentation/Erosion Controls

The objective of this strategy in the original plan was to initiate a collaborative effort among cities, counties, special districts, and state agencies to develop and implement an erosion / sedimentation source control program for non-agricultural areas, including urban, suburban, and rural residential developments. The strategy sought to identify and evaluate erosion control measures and standards for effectiveness and consistency across counties and municipalities, develop proposed language revisions for "model" ordinances and programs, and implement programs in pilot areas.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Identify Measure and Standards	Partial Implementation
Develop Model Programs/Schedule Revisions	Not Initiated
Identify Pilot Area/Conduct Briefings	Not Initiated
Implement in Pilot Area/Evaluate Success	Not Initiated
Implement in Remaining Non-Agricultural Areas	Not Initiated

CCC compiled an initial listing of standards found in existing ordinances from a number of counties and cities in the Sanctuary region, outlining minimal grading amounts that trigger permits, areas and types of grading where seasonal restrictions may apply, erosion control plan criteria, etc. The WQPP committee has not yet reviewed this data or developed related recommendations on standardization of ordinances or development of model programs and pilot projects.

Strategy Description
A regional evaluation of erosion control standards should be conducted to identify and address gaps and inconsistencies.

Activity 5.1: Evaluate erosion control measures and standards in county and city ordinances

Activity 5.2: Develop recommendations for revisions and work with local jurisdictions to implement

Status: Phase 2
Potential Partners: CCC, WQPP committee, cities and counties

Strategy WQPP-6: Storm Drain Inspection

The objective of this strategy in the original plan was to work with public works departments to develop a monitoring, mapping and management system in coastal cities for critical storm drains and outfalls with a history of contaminated flows or which drain to critical habitat.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Prepare Monitoring System in Two Priority Cities	Substantial Implementation
Implement System in Two Priority Cities	Substantial Implementation
Conduct Training in Coastal Cities	Partial Implementation
Conduct Evaluation	Not Initiated
Implement Additional Systems	Partial Implementation

Monitoring of the storm drain system has been initiated in several cities via the Urban Watch Program and the First Flush programs coordinated by the Sanctuary Citizen Watershed Monitoring Network. These programs are collaborative efforts between the Sanctuary, the cities, Coastal Watershed Council, and trained volunteers to take samples at selected locations monthly during the dry season and during the first large rain event of the year. These volunteer programs have been operating in Monterey, Pacific Grove, Capitola and Santa Cruz, and have successfully identified numerous sub-watersheds with high levels of coliform, metals or detergent contamination. Mapping and evaluation of the storm drain system was conducted under MURP grants with the cities of Monterey, Santa Cruz and Watsonville. Training on storm drain mapping and diagnostics, monitoring, and illicit discharge detection has been included in the MURP guidebook and in the regional urban runoff trainings.

Strategy Description
Efforts to monitor, map, diagnose and manage storm drains should be continued and expanded in partnership with local jurisdictions.

Activity 6.1: Continue and Expand First Flush and Urban Watch Monitoring Programs
Monitoring efforts for storm drain contaminants should continue and be expanded to additional jurisdictions through the Sanctuary Citizen Watershed Monitoring Network's First Flush and Urban Watch programs. This should be coordinated closely with local jurisdictions to select appropriate sampling sites.

Status: Phase 1

Activity 6.2: Conduct Follow-up with Public Works Departments
The Sanctuary should following up with the city public works departments to evaluate the contaminant hot spots identified by these monitoring programs and encourage them to conduct follow up assessments or targeted source control efforts.

Status: Phase 1

Activity 6.3: Expand Mapping, Diagnostic Capabilities and Illicit Discharge Programs
MBNMS should coordinate with local jurisdictions to promote expansion of their mapping and diagnostic capabilities and illicit discharge detection efforts, as part of their Phase 2 programs. Mapping, illicit detection, and monitoring should also be addressed in new technical training sessions.

Status: Phase 2
Potential Partners: volunteer monitoring groups, CCC, WQPP committee, cities and counties

Strategy WQPP-7: CEQA Additions

The objective of this strategy in the original plan was to provide local planners and elected officials with additional analytical tools to assess and reduce the potential changes in the quantity and quality of urban runoff resulting from proposed new development. This tool was to involve the incorporation and use of several questions related to urban runoff in the California Environmental Quality Assessment checklist which local planning departments use to evaluate impacts and target appropriate mitigation recommendations. The checklist was to be accompanied by a training module which would highlight how to conduct the assessment and outline potential best management practices which could be recommended to reduce water quality impacts.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Produce and Distribute Training Packet for Local Planners to Accompany Checklist	Completed, Needs Update
Complete Pilot Project of CEQA Checklist Revisions in Monterey County	Completed
Identify and Initiate Project in Remaining Jurisdictions	Partial Implementation
Adoption of CEQA Changes	Partial Implementation
Evaluate Effectiveness of Changes	Not Initiated

A revised CEQA checklist was developed in collaboration with Monterey County Planning Department, along with a guidebook to assist in training local planners to more thoroughly consider water quality issues related to new developments. The revised CEQA checklist was distributed to all the cities and counties in the Sanctuary region. The checklist was adopted by Monterey County and Santa Cruz County, and it is unknown what, if any, cities also adopted it.

Strategy Description
There is an ongoing need to work with additional local jurisdictions to revise their checklists and provide accompanying training guidelines on practices which could be included in new redevelopment projects.

Activity 7.1: Encourage the adoption of the CEQA checklist revisions in additional jurisdictions
This should include an assessment of which jurisdictions still have not adopted the CEQA checklist (likely to be most cities), and redistributions and outreach to those jurisdictions to encourage its adoption.

Status: Phase 1

Activity 7.2: Provide accompanying training materials and workshops
The CEQA additions training manual should be updated to incorporate new BMPs and distributed with the checklist. Regional training workshops should be conducted for planners to familiarize them in more detail with the issue. These trainings should include on-the-ground

demonstrations to gain an understanding that may be lacking when plan-checking in the office. BMPs are often very simple, both structurally and functionally, and with an improved understanding of them planners can ensure that they are included in new or redevelopment projects.

Status: Phase 1

Activity 7.3: Conduct follow up evaluations
Follow-ups should be conducted with planning department management to ensure that the checklist revisions are incorporated into their review process. Evaluations should also include an assessment of whether the revisions are leading to the inclusion of additional BMPs in projects.

Status: Phase 2
Potential Partners: Counties, cities, CCC

ACTION PLAN II: REGIONAL MONITORING, DATA ACCESS, AND INTERAGENCY COORDINATION

The second WQPP plan developed in 1996 addresses the need for a continuous and coordinated strategy for regional monitoring of water quality and compilation of water quality data on a regional level. It also addresses the need for a continuous regional framework for coordinating ways to address water quality, implement and update the WQPP plans and develop new ones where needed.

Strategy WQPP-8: Regional Monitoring

The objective of this strategy in the original plan was to coordinate and strengthen existing monitoring activities within the Sanctuary and its adjacent watersheds, and to develop a cost-effective, comprehensive approach to providing managers at federal, state, and local agencies and the public the information they need to protect aquatic resources.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Conduct Preliminary Assessment of Monitoring Programs in Sanctuary Region	Completed, Needs Update
Expand Assessment and Conduct Workshop to Develop Initial Recommendations	Completed, Needs Update
Evaluate Other Existing Regional Monitoring Approaches for Lessons Learned	Ongoing
Identify Specific Questions and Parameters To Be Monitored	Completed, Needs Update
Analyze Existing Monitoring Station Locations	Partial Implementation
Produce Regional Monitoring Plan	Completed, Needs Update
Develop Program Infrastructure To Sustain Long-Term Effort	Partial Implementation
Implement Monitoring Program	Substantial Implementation
Review, Interpret, and Communicate Results	Partial Implementation

Significant implementation has been initiated on regional coordination and strengthening of government-collected data and volunteer data, and on the development of a regional monitoring program. As recommended in the plan, the Central Coast Regional Water Quality Control Board has led the formation of a regional monitoring program called the Central Coast Ambient Monitoring Program (CCAMP). CCAMP collects long-term data on a rotational basis in several Sanctuary watersheds as well as monitoring of critical river mouths. It has also coordinated a regional monitoring effort (CCLEAN) with the sewage treatment plants within the Sanctuary to develop ambient water quality data in addition to effluent monitoring. The variable nature of state funding and budget cuts has unfortunately led to monitoring program reductions in some of these programs.

For volunteer monitoring, the Sanctuary Citizen Watershed Monitoring Network has been established to coordinate approximately 20 volunteer monitoring groups in the Sanctuary watersheds. The Network provides standardized training and equipment, a regional website, guidance on data entry, media publicity to inform the public, and coordination and outreach to resource managers on monitoring results. It is also implementing a certification program that can be used to rank the quality of data collected by volunteers. The program also coordinates and sponsors several regional monitoring programs, including an Urban Watch program focused on dry weather storm drain sampling, a First Flush program focused on sampling of the first heavy rain of the season, and a Sanctuary-wide Snapshot Day event which samples urban and rural water quality on Earth Day each year. These volunteer monitoring efforts are a partnership between the Sanctuary Foundation, Coastal Watershed Council, the RWQCB, CCC, local cities, and volunteers.

Strategy Description
Although considerable progress has been made on development and implementation for both government and volunteer monitoring programs, much work remains to continue and improve the efforts.

Activity 8.1: Develop a core set of data for long-term assessments
A core set of data sufficient for long-term assessment and trend analysis should be identified which can be continuous over many years, and monitoring programs to collect these data should be continued or initiated. This core set of data would be the focus during budget cutbacks.

Activity 8.2: Integrate regional monitoring across agencies
The Sanctuary should work with the Central Coast Regional Water Quality Control Board to integrate monitoring efforts with additional programs throughout the Sanctuary, including the San Francisco Bay Regional Water Quality Control Board, county and watershed group programs.

Activity 8.3: Integrate water quality data with SIMoN
Water quality monitoring should be integrated with the SIMoN program, and coordinated with biological monitoring efforts.

Activity 8.4: Develop coordinated long-term interagency funding sources
For both government data and volunteer efforts, coordinated long-term funding sources, possibly shared by a number of agencies, need to be identified, obtained and stabilized to reduce the variability associated with grant work.

Activity 8.5: Enhance training, assistance and certification of volunteer monitoring groups and coordination of annual events
Year-round coordination, training and assistance should be enhanced for existing and new volunteer groups to improve their effectiveness and longevity. MBNMS should also continue coordination of large annual volunteer events such as Urban Watch, First Flush and Snapshot Day.

Activity 8.6: Improve public awareness of monitoring efforts
Additional work is needed to improve public awareness of monitoring efforts, particularly of volunteer groups, including efforts with print, radio and TV media.

Status: Phase 1
Potential Partners: RWQCBS, SWRCB, CWC, Ocean Conservancy, CCC, counties, EPA, research institutions, volunteer groups, environmental organizations

Strategy WQPP- 9: Data Access

This objective of this strategy in the original plan was to develop a digital data access system to link water quality data and related parameters for the Sanctuary's watersheds and ocean areas. This database was to provide environmental scientists and resources managers with the tools to evaluate problems and make environmental management decisions.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Identify Existing Monitoring Data Sets	Completed, Needs Update
Form Interagency Data Task Force	Partial Implementation
Identify Specific Questions To Be Answered by Data	Substantial Implementation
Identify and Evaluate Existing Database Systems and Networks	Substantial Implementation
Identify Relevant Data, Standard Format and Access System Design	Partial Implementation
Develop QA/QC Protocols and MOAs	Partial Implementation
Develop Metadata and Summary Data for Each Program	Partial Implementation
Conduct Annual Performance Review	Partial Implementation

The Sanctuary and EPA conducted an initial summary of data sets available. The RWQCB has developed a regional database and GIS mapping system for CCAMP to display water quality data collected by the RWQCB. The Sanctuary Citizen Watershed Monitoring Network has also been working with the RWQCB to allow display of its data in a volunteer version of the CCAMP system. CCAMP and the Sanctuary Citizen Watershed Monitoring Network have been working to develop QA / QC protocols and work with watershed groups to adopt these procedures. The Central Coast Joint Data Committee administered by AMBAG has also made progress in compiling and sharing GIS information on the region's watersheds including topography, land use, parcels, etc. CCAMP and the Sanctuary Citizens Watershed Monitoring Network have produced annual or event-related summary data reports (e.g. First Flush, Snapshot Day, and Urban Watch). However, additional work remains to be done by these groups and others to facilitate the display and ready access to water quality data and related information from a variety of sources.

Strategy Description
Although significant progress has been made of this strategy, much additional work remains to be conducted to develop a database or series of databases which can integrate information from a number of sources and is packaged in a user-friendly way as a decision-making tool.

Activity 9.1: Establish a database or system that integrates data from various sources
Additional evaluation should be conducted to determine if the CCAMP database can meet Sanctuary needs, and either move to expand this system or develop alternative approaches which can link federal, state, county and university data. The water quality database should also be integrated with or become part of the SIMoN database.

Activity 9.2: Certify data quality for volunteer groups and incorporate into database
The version of the database for volunteer data should be expanded. This will require certification of the data quality of additional watershed groups, including developing QA/QC protocols for their data.

Activity 9.3: Improve packaging and distribution of data to decision-makers and the public
Additional focus needs to be directed to packaging and distributing both government and volunteer data to decision makers in an understandable way, and working with them to conduct follow up to track and reduce sources of contamination. This should include an annual report of water quality trends in the Sanctuary that integrates data from a number of programs.

Status: Phase 1
Potential Partners: RWQCBs, SWRCB, counties, volunteer groups

Strategy WQPP-10: Interagency Coordination

The objective of this strategy in the original plan was to develop a continuous regional framework for coordinating ways to address water quality, implement and update the WQPP plans and develop new ones where needed.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Establish a Management Council for The WQPP	Partial Implementation
Establish Linkages with Other Groups	Substantial Implementation
Coordinate Implementation of WQPP Strategies	Substantial Implementation
Prioritize Funding Goals	Substantial Implementation
Coordinate Permit Review	Partial Implementation
Coordinate Enforcement Activities	Partial Implementation
Evaluate New Problems and Develop New Strategies	Substantial Implementation

The WQPP committee served as a coordinated regional framework during the development of the first four plans and assists in coordinating their implementation. Various subgroups and members of the committee work together with Sanctuary staff to pursue specific implementation projects, pursue funding, etc. A charter for a more formal WQ Council was developed several years ago, but has not been implemented. As part to the JMPR review, the WQPP committee indicated that the basic format of the existing committee meets the needs of the WQPP and can serve to address the major steps in this strategy, and that a more formal Water Quality Council is not necessary. Regarding evaluating new problems and issues, many committee members assisted with the development of the Beach Closures Action Plan, and implementation of this plan will eventually be overseen by the committee.

Strategy Description
The activities under this strategy regarding plan development, funding and implementation, and addressing new problems should be continued and strengthened by the existing committee.

Activity 10.1: Review and update committee membership and structure
Committee membership should be reviewed and potentially expanded to incorporate new issues and activities. Establishment of ongoing subcommittees that oversee implementation of individual plans should also be considered, as this approach has been very effective in implementing the Agriculture and Rural Lands Plan.

Activity 10.2: Continue regular committee meetings and coordination to oversee implementation and address new issues
The committee needs to reestablish a regular quarterly meeting schedule that has been interrupted by a staff vacancy, as well as coordinate between meetings on a regular basis. Committee meetings and other communications should focus on overseeing and enhancing joint implementation of the plans, evaluating progress, and addressing new issues as they arise.

Activity 10.3: Coordinate WQPP funding
The committee's efforts should include coordinating grant applications with partners, working with MOA signatory agencies to highlight WQPP plans in their grant RFPs, and strenthening fundraising efforts through the Sanctuary Foundation.

Activity 10.4: Develop an annual report and workshop on the WQPP
An annual report and workshop on the WQPP and its activities should be developed that summarizes progress on implementation, and assesses next steps, identifies partnerships and water quality trends. This should include contributions from the many partners in the program.

Status: Phase 1
Potential Partners: WQPP Committee, MOA signatories

ACTION PLAN III: MARINAS AND BOATING

This action plan developed in 1997 describes strategies designed to reduce water pollution from certain activities associated with marinas and boating within the Sanctuary. Boater-generated impacts on water quality generally fall into four categories: toxic metals primarily from anti-fouling paints, hydrocarbons from motor operation and maintenance procedures, solid waste and marine debris from overboard disposal, and bacteria and nutrients from boat sewage. This plan took the approach that much of this pollution can be reduced through education and training programs, application of new technologies and on-site facilities.

Strategy WQPP-11: Public Education and Outreach

The objective of this strategy in the original plan was to expand and build upon existing efforts conducted by individual harbors to develop a coordinated regional education and outreach program. These programs sought to communicate to boaters the environmental, recreational and economic impacts of pollution.

The recommendations listed under the following activities generally consist of similar actions that can be generalized as:

- Compiling existing materials for each topic;
- Defining programs and target audiences;
- Preparing materials and developing distribution networks and programs; and,
- Contacting the targeted audiences with the materials / implementing programs.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Review Existing Materials, Define Audience / Topics	Completed
Bilge Wastes and Waste Oil Education	Substantial
Product Information/Toxics Disposal Education	Partial Implementation
Marine Debris Education	Partial Implementation
Vessel Fueling Education	Not Initiated
Sewage Discharge Education	Partial Implementation
Underwater Hull Cleaning Education	Not Initiated
Education on Existing Laws	Substantial Implementation
Develop an Ongoing Distribution Program	Partial Implementation
Encourage Community Use/Stewardship of Harbor	Not Initiated

There are several active partners that have been developing and distributing informational and educational products for over 5 years, including Save Our Shores' Clean Boating Network and the California Coastal Commission's Boating Clean and Green Program. Grant funded educational efforts developed by the Sanctuary and/or SOS include a harbor water quality poster, water quality signage put in place at all the harbors, signage at bilge pumpout facilities, a bilge

pumpout brochure. SOS also has developed a Dockwalker program that conducts one-on-one outreach and distributes educational materials to boaters at the harbors. Education and promotional activities have also accompanied the installation of new bilge pumpout facilities at all of the harbors.

Strategy Description
This strategy will build upon and expand existing materials and programs and make outreach a regular occurrence.

Activity 11.1: Sustain and Develop One-on-one Boater Outreach Programs
The WQPP should work with various organizations to sustain and develop one-on-one programs with boaters such as Dockwalkers, including recruitment of volunteers and obtaining funding. This should include efforts to distribute materials and discuss with boaters the above list of water quality issues, with special emphasis on use of the bilge water and sewage disposal stations, and on hull cleaning practices that can affect both water quality and exotic species problems.

Status: Phase 1
Potential Partners: SOS, CCC, harbormasters

Strategy WQPP-12: Technical Training

The objective of this strategy in the original plan was to develop and implement a regional technical training program for harbor, marina, and boatyard employees within the Sanctuary.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Identify Subject Areas	Completed
Compile Training Materials	Completed
Identify Instructors, Trainers, and Funding	Partial Implementation
Solicit Participation and Develop Incentives	Partial Implementation
Conduct Regional and On-Site Workshops	Partial Implementation
Evaluate Workshops and Modify as Needed	Not Initiated

General water quality training modules were compiled for the harbors, and the package was introduced to several of the harbors as part of their training for the bilge water pumpout facility. Ongoing regional training has not been addressed, except for any staff training efforts already underway by harbormasters.

Strategy Description
A review of technical training needs and opportunities should be conducted and programs developed to address gaps.

Activity 12.1: Update Training Materials as Necessary

Activity 12.2: Identify and Pursue Opportunities to Conduct On-site Trainings

Status: Phase 3
Potential Partners: Harbormasters, SOS

Strategy WQPP-13: Bilge Waste Disposal and Waste Oil Recovery

The objective of this strategy was to facilitate the collection of contaminated bilge water through the construction and operation of new bilge water pumpout and waste handling facilities.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Initiate Public Education Program	Substantial Implementation
Provide Absorbent Pads	Substantial Implementation
Identify Permits and MOAs	Completed
Identify Funding Sources	Completed
Identify Technology	Completed
Identify Appropriate Sites	Completed
Construct Pumpouts	Substantial Implementation
Publicize Location/Increase Enforcement	Partial Implementation

In 1999, the Sanctuary in collaboration with Ecology Action and Save Our Shores received a grant from the California Integrated Waste Management Board (CIWMB) to install bilge and crankcase oil pumpouts at Monterey and Moss Landing harbors, and to distribute absorbent pads. A system was later installed by SOS in Santa Cruz harbor in 2002 through a similar grant. These systems, with a sigificant amount of education and promotion, have been very successful, leading to the recycling of over 8,000 gallons of oil in Monterey and Moss Landing harbors. The systems however, have proved to be expensive to operate and maintain for the harbors. In addition, the preexisting pumpout station at Pillar Point harbor has aged significantly and is now of insufficient capacity and needs to be replaced.

Strategy Description
The bilge pumpout system equipment and procedures should be updated as needed, and the use of the facilities promoted.

Activity 13.1: Develop Incentives and Promotions to Encourage Facility Use
Incentives should be developed to encourage boaters to use the pumpouts, along with an ongoing outreach program to promote the facilities.

Activity 13.2: Increase the Economic Viability of the Systems
Measures should be developed that will make the region's systems more economical to maintain, including revisiting the idea of sending the cleaned effluent to the sewer treatment plant or using a low-threat discharge permit.

Activity 13.3: Upgrade the Bilge Pumpout Facility at Pillar Point
The WQPP should work with the harbor to obtain funding for a new system, as well as assist with coordinating an appropriate disposal method.

Strategy WQPP-14: Hazardous and Toxics Material Management

The objective of this strategy was to initiate a program to provide periodic collection events at harbor districts in the Sanctuary. Additionally, it sought to resolve potential regulatory and liability issues that currently impede harbor districts taking a more active role in hazardous materials management, and to work with regional and county waste management agencies to incorporate harbor waste collection initiates into existing programs. It identified the need to develop convenient disposal options for boaters that allow for the drop-off and collection of hazardous materials in harbors and to establish procedures for the collection of batteries, paints, solvents, antifreeze, and waste oil / fuels at periodic collection events.

Implementation of WQPP Steps to Date

Steps	Implementation Status
Plan Periodic Waste Collection and Pickup Events	Not Initiated
Obtain Funding	Not Initiated
Develop Sites	Not Initiated
Establish Procedures Handling Materials	Not Initiated
Implement Periodic Collection and Pickup Events	Not Initiated
Implement Education Program	Partial Implementation

No specific targeted work has been conducted on this strategy, although hazardous material handling was addressed in the outreach materials distributed to boaters under the education strategy.

Strategy Description
In following up with several harbormasters on this strategy as part of the JMPR process, they indicated that hazardous materials were now being handled adequately and that they periodically haul them off to designated disposal sites. A more thorough review at each harbor should be completed in future years, and proper handling of these materials promoted to boaters.

Activity 14.1: Evaluate the Process for Storing, Handling and Disposing of Materials
Conduct a more thorough evaluation of the process used at each harbor to identify and address gaps in the system, if any.

Activity 14.2: Incorporate Hazardous Material Training into Education and Outreach to Boaters

Status: Phase 3
Potential Partners: Harbormasters, SOS

Strategy WQPP-15: Topside and Haul-out Vessel Maintenance

The objective of this strategy in the original plan was to identify and promote regional guidelines on practices that reduce contaminants from hull wash-water and first flush runoff from boatyards and parking lots. Additionally it sought to promote continued and expanded use of dust and drip containment methods and paint stripping technologies and products that result in reduced emissions. It recognized the need to review the effectiveness of policies and pollution controls addressing maintenance work at boat slips, parking lots, and unregulated work areas and to promote boat maintenance methods that generate less pollution through education efforts and/or "Clean Worker Contract" programs.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Promote New Stripping/Refinishing Technologies	Not Initiated
Improve Containment and Filtering of Paint	Not Initiated
Ensure Compliance with Existing Regulations	Not Initiated
Improve Control and Filtering of Runoff	Not Initiated
Review Policies Regarding Work in Slips/Parking Lots	Not Initiated

No specific targeted work was conducted by the Sanctuary on this strategy, although various harbors and boatyards may have been addressing parts of the strategy**.**

Strategy Description
Contaminants from hull-washwater and runoff from boatyards and parking lots should be addressed by improved management practices.

Activity 15.1: Promote New Stripping and Refinishing Technologies

Activity 15.2: Improve Containment and Filtering of Paint

Activity 15.3: Ensure Compliance with Existing Regulations

Activity 15.4: Improve Control and Filtering of Runoff

Activity 15.5: Review Policies Regarding Work in Slips/Parking Lots

Status: Phase 2
Potential Partners: Harbormasters, boatyards, SOS, RWQCB

Strategy WQPP-16: Underwater Hull Maintenance

This strategy in the original plan sought to initiate a program targeted at boat hull maintenance that promotes less toxic paints and improved under-water cleaning practices to reduce discharges to harbor waters. This would be accomplished by distributing information on less toxic paints and results of demonstration projects that evaluate new materials and maintenance methods that reduce discharges. The need to consolidate and promote guidelines for bottom paint preparation and to reduce excessive sloughing of paint was also identified. This strategy sought to initiate a training and certification program for divers who conduct under water cleaning to reduce discharges from hull cleaning practices.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Promote Safe Marine Products	Partially Implementation
Promote Results of Demonstration Events	Not Initiated
Improve Bottom Paint Preparation	Not Initiated
Initiate Hull Training and Cleaning Certification	Not Initiated

No specific regional work has been conducted on this strategy, although the California Clean Boating Network is considering the issue, and safe products lists have been included in education materials.

Strategy Description
Improvements in underwater hull maintenance should be implemented due to the potential to discharge numerous toxic chemicals into harbors and due to the growing concern regarding introduction of exotic species into harbors and coastal areas. Boaters and harbormasters need to be updated on newly developed improved methods and need to have resources available to disseminate to interested boaters. Guidelines should include recommendations on preventing the spread of exotic species in additional to reducing water quality contamination.

Activity 16.1: Promote Safe Marine Products and Procedures for Antifouling Use
Safe products for use as hull paints should be identified and promoted via outreach and demonstration events. Proper techniques for bottom paint preparation to reduce sloughing should also be included in the guidelines and demonstrations.

Activity 16.2: Initiate Guidelines and Trainings for Hull Cleaning
Develop guidelines and training for divers who conduct underwater hull cleanings, including recommendations to reduce water quality contaminations and spread of exotic species. Consider development of a certification program for cleaners who use proper techniques.

Status: Phase 1
Potential Partners: Harbormasters, paint supply companies, boating organizations, California Clean Boating Network

Strategy WQPP-17: Harbor Pollution Reduction Progress Review

The objective of this strategy was to develop simple procedures and checklists for harbormasters to assess the current status of their pollution control efforts, and to track annual progress towards pollution reduction.

Implementation of WQPP Steps to Date

Steps	***Implementation Status***
Develop Report Format and Checklist	Not Initiated
Develop Tracking System	Not Initiated
Annual Review and Recommendations	Not Initiated
Develop "Clean Harbor" Recognition Program	Not Initiated

No specific targeted work on this strategy, and the WQPP committee recommended no further action on this strategy at this time.

Status: Phase 3
Potential Partners: harbormasters, environmental organizations, RWQCB

ACTION PLAN IV: AGRICULTURE AND RURAL LANDS

The Agriculture and Rural Lands Plan was developed in 1999 to address agricultural runoff in the form of sediments, nutrients and persistent pesticides. The original plan outlines six sections containing twenty-four strategies and ninety activities intended to protect and enhance the quality of water that drains into the Sanctuary while sustaining the economic viability of agriculture. To more briefly summarize these recommendations for inclusion in the JMPR, each of the 6 chapters or sections of the original plan is here termed a strategy and each of the original 24 strategies is here termed an activity, allowing for the omission of some of the detailed steps that can be referred to in the original plan. The strategies include organizing agricultural industry networks and watershed groups, increasing technical assistance and education, funding and economic incentives for conservation measures, permit coordination for conservation practices, and improving maintenance practices for rural roadways and public lands.

The many partners that are working together throughout the six-county area on implementation of the Agriculture and Rural Lands Plan are known as the Agriculture Water Quality Alliance (AWQA). AWQA includes agriculture industry groups, federal, state, and local agencies, technical experts, environmental organizations and university researchers. The AWQA Steering Committee, directing the effort, has representatives from the Sanctuary, Coalition of Central Coast County Farm Bureaus, Natural Resources Conservation Services, Resource Conservation Districts, and University of California, Cooperative Extension.

Because the Agriculture and Rural Lands Plan is relatively new, there has been less time for implementation to proceed and the original recommendations are still relevant. Therefore, we are using a slightly different format to identify future activities for this portion of the WQPP plan, as all current strategies and activities in the original plan will be maintained as future activities in this JMPR action plan. Also, as this is a much longer plan in terms of number of original strategies and activities, both the recommendations and the implementation to date are summarized only at a broad level.

Strategy WQPP-18: Establish Agricultural Industry Networks to Address Water Quality

Strategy Description
The three activities in this strategy establish a process for developing industry-led networks of landowners and operators to address agricultural nonpoint pollution issues. Watershed-level agricultural working groups will be established in the Sanctuary's watersheds, under the leadership of existing large agricultural organizations such as Farm Bureaus and related industry groups. These industry networks will take the lead in organizing and working with their own members to establish joint projects for nonpoint source management in priority watershed areas. Activities in this section also include identifying priority target regions for joint projects, conducting outreach on nonpoint issues, assisting growers and ranchers in developing and carrying out voluntary site-specific management plans, obtaining outside technical assistance as needed, and tracking implementation success over time.

Activity 18.1: Establish Regional Industry Networks as a Framework for Addressing Nonpoint Source Management

Status: This activity is underway and includes ongoing implementation.

Activity 18.2: Identify Priority Sites for Landowner Joint Projects

Status: This activity has been substantially implemented.

Activity 18.3: Implement Nonpoint Source Management Practices Using Industry-Led Watershed Groups

Status: This activity has been partially implemented.

Implementation to date
The Coalition of Central Coast County Farm Bureaus formed in 2000 to oversee the agricultural industry's regional implementation of this plan, and continues to meet quarterly. Ten Agricultural Watershed Working Groups have been organized by the Coalition since then. Over 150 farmers and ranchers participate in these groups by developing Water Quality Plans for their properties and installing conservation practices that reduce erosion and nutrient runoff. Water quality plans have been developed for 97,200 acres of crop and rangeland, and applied on 77,500 acres of crop and rangeland. A diversity of crops are represented in Agricultural Watershed Groups: cattle, vegetables, vineyards, orchards, field and greenhouse flowers, strawberries, pumpkins, etc. Many additional groups are in the process of being formalized. Additional work is needed to ensure that growers who are not part of existing large organizations are also reached. A Technical Advisory Committee has established a template for annual tracking of on the ground implementation of practices, and has initiated water quality monitoring surrounding a pilot subwatershed.

Status: Phase 1
Potential Partners: Farm Bureau Coalition, AWQA committee

Strategy WQPP-19: Strengthen Technical Information and Outreach to Agriculture

Strategy Description
Although extensive technical information exists on agricultural techniques and tools to improve water quality, this information is not always readily available/easily usable for growers and ranchers. This strategy contains 7 activities developed to make this information more accessible and useful through increased support for existing technical outreach services, development of networks, cross-training of outreach staff, packaging of easily understood information, and conducting on-site follow-up with workshop participants.

Activity 19.1: Compile, Develop and Distribute User-Friendly Technical Information on Agricultural Conservation Practices

Status: This activity has been partially implemented.

Activity19.2: Strengthen Referral Network and Cross-Training in Sediments, Nitrates And Pesticides For Technical Field Staff

Status: This activity has been partially implemented.

Activity 19.3: Increase Agency Staff Time to Provide Technical Field Support and Prevention Efforts

Status: This activity has been partially implemented.

Activity 19.4: Strengthen Information Transfer From Industry to Agencies to Keep Up-To-Date On Technical Advances in Conservation Measures

Status: This activity has been partially implemented.

Activity 19.5: Strengthen Grower/Rancher Peer Advisory Networks to Share Conservation Information Among Peers, Including Outreach to Both Landowners And Tenants

Status: This activity has been partially implemented.

Activity 19.6: Evaluate And Distribute Information on Cost-Effectiveness of Water Quality Management Practices

Status: This activity has been partially implemented.

Activity 19.7. Develop And Promote Self-Monitoring Tools for Conservation Management Practices to Assess Problems And Track Success

Status: This activity has been partially implemented**.**

Implementation to Date
Using a congressional allocation to USDA to implement the Sanctuary's agricultural plan, several technical field staff have been hired by the agricultural agencies to assist farmers and ranchers in the six-county area, including an Agronomist, Water Quality Monitoring Specialist, Rural Roads Engineer, Rangeland Specialist, Irrigated Agriculture Specialist, Hydrologist, and an Outreach Coordinator.

Over 300 farmers and ranchers have attended a University of California Cooperative Extension training course designed to help farmers develop individual water quality protection plans for their properties. Numerous workshops have been held to train farmers in the benefits and use of specific conservation practices such as cover crops, stream bank protection, irrigation evaluation, and crop row alignment. Training on monitoring practices has also been conducted for the Farm Bureau coordinators.

Research has been completed on the cost effectiveness of 15 common conservation practices used in the six-county region. This information will be a useful tool for landowners to understand the financial costs and benefits of each practice.

Status: Phase 1
Potential Partners: AWQA, RCD

Strategy WQPP-20: Improve Education and Public Relations on Watersheds and Agricultural Conservation Measures

Strategy Description
There is a need for improved education of the general public about agricultural conservation issues, and of agricultural groups and the public about watershed issues as a whole. The 3 activities in this section were developed to enhance public, grower, government agency, and media knowledge about watershed issues, and develop better recognition of the conservation practices that the agricultural community employs.

Activity 20.1: Increase Public Knowledge of and Support for Agriculture and Agricultural Conservation Measures through Media and Outreach

Status: This activity has been partially implemented.

Activity 20.2: Increase Grower and Public Awareness of Watershed-Based Management by Incorporating Watershed Message into Existing Programs and Conducting Media and Outreach

Status: This activity has been partially implemented

Activity 20.3: Increase Agency Staff Understanding of Agriculture Through Development of Bulletins and Conducting Tours

Status: This activity has been partially implemented.

Implementation to Date
Two major press events have been held to highlight AWQA activities and promote conservation practices. A public relations firm was contracted to help develop a media kit explaining watershed management and agricultural conservation practices that protect water quality. A freelance journalist has been contracted to develop stories on conservation practices for both general media and industry trade journals. Resource agency staff have attended many of the agricultural workshops and field days hosted by AWQA partners. The UCCE Farm Water Quality Short Course, taken by all members of Watershed Working Groups, includes an overview presentation on watershed definition and function. An AWQA Web site is currently under construction, designed to educate both the public and the agriculture industry about watershed management and agricultural conservation practices. Additional outreach models need to be developed to inform farmers and ranchers who are not involved in Farm Bureau, or who do not speak English as a primary language.

Status: Phase 1
Potential Partners: AWQA

Strategy WQPP 21: Coordinate and Streamline Regulations for Conservation Projects

Strategy Description
This strategy stems from comments from both agency staff and landowners on the difficulty of the existing permitting process for conservation practices due to multiple agencies having jurisdiction over projects. A grower or rancher may need multiple permits from each of several agencies at the local, state, and federal levels, with separate fees, different requirements, different timelines, and sometimes contradictory mandates, even for projects which have a beneficial impact on water quality such as sediment basins, vegetative buffers, etc. The 3 activities in this section were developed to simplify and coordinate the existing permitting process for practices which protect water quality, more effectively apply existing regulations, and strengthen collaborative efforts between the regulatory agencies and the landowners.

Activity 21.1: Develop User-Friendly Permit Guidebooks and Central Locations for Permit Information for Growers Initiating Conservation Projects

Status: Phase 2, This activity has been partially implemented.

Activity 21.2: Develop Regional or Watershed-Based Permits for Conservation Management Practices Which Cover the Projects of Multiple Growers Which Adhere to Defined Agency Conditions

Status: Phase 1, This activity has been substantially implemented.

Activity 21.3: Improve Collaborative Efforts Between Regulatory Enforcement Agencies and Landowners to Improve Water Quality Practices

Status: Phase 2, This activity has not been implemented.

Implementation to Date
A watershed level permit for water quality improvements has been developed for the Salinas Valley, modeled after the successful Elkhorn Slough permit coordination program. Under a watershed permit, conservation practices are pre-approved by the agencies, and growers can work directly with the Natural Resources Conservation Service to design and install the conservation practice. This is expected to lead to an increased number of on-the-ground projects that protect water quality. A promotional brochure on the permit streamlining program for the Salinas Valley has been developed and distributed. Work has begun to develop a similar streamlining program in Santa Cruz County.

Potential Partners: NRCS, RCD, AWQA Committee

Strategy WQPP-22: Improve Funding Mechanisms and Incentives for Water Quality Improvements

Strategy Description
Growers and ranchers are sometimes discouraged from installing conservation practices due to the initial costs for construction and then ongoing maintenance. The 5 activities in this section include ways to assist landowners and tenants in developing funding and economic incentives for agricultural conservation measures, and to promote their long-term economic benefits. Also included are strategies to inform growers and ranchers about tax policies that provide tax relief for implementing conservation measures, and to develop new policies that can serve as an additional incentive for voluntarily adopting such measures.

Activity 22.1: Improve Agricultural Community's Knowledge of and Access to Funding Sources Through Compiling and Distributing Funding Information and Promoting Assistance with Applications

Status: This activity has been partially implemented.

Activity 22.2: Facilitate Availability of Trained Assistance for Conservation Field Projects Through Utilizing Low Cost Labor Sources such as Americorps, Volunteers And Interns

Status: This activity has not been initiated.

Activity 22.3: Broaden Applicability of Cost-Share Programs for Conservation Measures and Streamline Application Process to Encourage Use by Both Tenants and Landowners

Status: This activity has not been initiated.

Activity 22.4: Increase Understanding of Existing Tax Benefits for Installing Water Quality Conservation Measures Through Development and Distribution of a Guide

Status: This activity has not been initiated.

Activity 22.5: Improve Tax Incentives for Implementing Conservation Measures

Status: This activity has not been initiated.

Implementation to Date
The Farm Bureaus have obtained funding to assist their watershed working groups from State grants and private funding sources. NRCS has also substantially increased its funding under the EQIP cost-share program to growers installing conservation projects in several key Sanctuary watersheds. Additional funding sources are available under the new Farm Bill. However many of the specific recommendations in this section regarding improving funding for conservation measures have not been initiated.
Status: Phase 2
Potential Partners: NRCS, AWQA Committee

Strategy WQPP-23: Improve Water Quality Management on Public Lands and Rural Roads

Strategy Description
This section addresses management issues for public and private rural lands that may include activities other than farming and ranching. Roadways in rural areas can generate significant erosion and sedimentation problems if not properly maintained. The intent of the 3 strategies in this section is to improve both public and private planning and maintenance practices for rural roadways, in order to reduce erosion and properly dispose of sediment. In addition, this section includes a strategy to address the management and maintenance related to erosion on public trust lands, which is often deficient due to a lack of foresight and funding for long-term maintenance/improvement needs.

Activity 23.1: Provide for Maintenance Practices to Address Sedimentation on Public Roads and Waterways through Guidelines and Trainings for Public Works Staffs

This activity has been partially implemented.

Status: Phase 1

Activity 23.2: Reduce Sedimentation from Rural Unsurfaced Roads and From Surfaced Roads that are Not Maintained Through Mapping, Technical Outreach to Landowners on Maintenance or Decommissioning, and Modifications During Transfer of Ownership

This activity has been partially implemented.

Status: Phase 1

Activity 24.2: Improve Conservation Measures on Agency/Public Trust Lands

This activity has not been initiated.

Status: Phase 2

Implementation to Date
Training workshops for Public Works staff have been presented in Santa Cruz and San Mateo Counties. Guidelines for road maintenance practices that can prevent sedimentation and erosion are being finalized in Santa Cruz County and will be distributed to other counties for adoption of similar practice standardization. The recently hired Rural Roads Engineer (NRCS) has undergone training to begin his advisory role in the six-county area. However, this section of the plan has not yet received a strong focus due to attention paid to the agricultural sections of the plan in early years.

Potential Partners: Counties, RCDs, AWQA, NRCS, land trusts, BLM, USFS, CCC, state and local park districts